Attachment C

C-17 TRANSITION MASTER PLAN

Prepared for the City of Long Beach

Pacific Gateway

ACKNOWLEDGEMENTS

The Pacific Gateway Workforce Investment Network (PGWIN) and the City of Long Beach acknowledge members of the community that contributed to the development of the C-17 Transition Master Plan by responding to surveys or attending public charrettes. This document was compiled by Public Consulting Group, Inc., who has overseen the coordination of the development of the C-17 Transition Master Plan. BW Research, Dudek, John Kaliski Architects, and Applied Development Economics contributed as consultants and researchers.

PUBLIC CONSULTING GROUP

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PROJECT BACKGROUND

In 2013, Boeing Corporation announced it would end production of the C-17 Globemaster, a large military transport aircraft, causing the closure of the C-17 manufacturing facility in Long Beach, California. This closure resulted in the layoff of approximately 1,600 workers and caused additional economic impacts across the supply chain. In addition to manufacturing, engineering, and project management jobs within the aerospace and defense sector, other job losses will occur within the service realm, including health care, retail trade, professional, accommodation and food services, and more.

In 2015, the Department of Defense's Office of Economic Adjustment awarded the City of Long Beach a Defense Industry Adjustment grant to develop and implement a comprehensive economic transition program in the wake of the C-17 production facility closure. The grant is focused on ensuring the region can retain its regional skills base, competitiveness, and sector expertise. With this grant, the City designed the C-17 Transition Program. The Program is organized into three tracks, the goals of which are stated below:

1. **Economic Development Planning**: To adjust effectively to the impact of the Boeing facility closure and to identify opportunities to advance the site, the supply chain, and the regional cluster
2. **Land Use and Infrastructure Planning**: To assess the existing conditions of the Boeing C-17 facilities and develop conceptual reuses with the goal of ensuring compatibility with future economic development strategies
3. **Assistance to Impacted Firms and Workers**: To establish a Boeing and defense dislocated worker case management tracking platform that incorporates customized training modules and provides direct assistance to impacted suppliers

This document, the *C-17 Transition Master Plan* is a key outcome of the overall transition program. The following chapters summarize the Economic Development Planning and Land Use and Infrastructure Planning activities under the C-17 Transition Program and introduce the strategies that will guide the City's reponse to the closure of the Boeing Facility. This Executive Summary presents some key findings and outcomes outlined in the Plan.

ECONOMIC DEVELOPMENT PLANNING – KEY FINDINGS

The Economic Development Planning section includes a profile of the local workforce and existing employment opportunities, a cluster mapping analysis, and surveys of local employers and dislcoated workers. Each of these chapters provide insight into the economic activity that is driving employment and growth in Long Beach.

Overall, employment in Long Beach has been growing since 2011, with some growth concentrated in high paying industries with solid career pathways like healthcare. However, the industry with the highest rate of employment growth in Long Beach is Food and Accommodation Services (70.8% since 2010), which includes positions in mostly low-wage occupations.

Employment in Long Beach's Accommodation and Food Services Industry has grown 70.8% since 2010.

Additionally, employment is growing in six of seven major regional industry clusters, five of which pay wages above average for the region. These clusters are: Finance, Insurance, & Real Estate; Information & Communication Technologies; Biotech and Medical Devices; Business Services; and Healthcare.

Five industry clusters are growing in employment and offer wages higher than the regional average.

Although employment is growing in demanded industry sectors, employers surveyed under the C-17 Transition Program report having difficulty filling both entry level and non-entry level positions. A lack of hard and soft skills was cited by employers as the most prevalent barrier to

hiring qualified candidates, as opposed to a lack of relevant work experience or education.

Employers reported a lack of technically skilled candidates as the largest barrier to hiring qualified employees

However, dislocated workers that were surveyed under the C-17 Transition Program reported that lacking a network in the industry in which they are seeking employment is their most significant barrier to finding a new job. This suggests that aligning the workforce to meet the needs of growing industries may require a strategy that develops job seekers' technical and non-technical skills while exposing them to networking opportunities in their targeted industry.

LAND USE AND INFRASTRUCTURE PLANNING – KEY FINDINGS

This section includes a summary of existing conditions at the site of the former C-17 manufacturing facility. Additionally, it presents a summary of the public outreach efforts that took place to ascertain the community's priorities with respect to the reuse of the Boeing facility. Finally, it presents conceptual reuse alternatives based on site paramaters and potential industry activity and assesses the fiscal impact of these alternatives for the City.

The site considered under the C-17 Transition Program include approximately 210 acres spread across 3 areas: the former Boeing C-17 site, the airport-adjacent City-owned property, and the properties along the east and west side of Cherry Avenue adjacent to the C-17 site.

The public was invited to provide their vision for the future of the C-17 site by participating in a charrette hosted in August, 2016. Additionally, a survey was deployed to a random sample of residents in and around Long Beach to study public opinion related to the redevelopment of the site. Many ideas, representing a broad spectrum of potential programs for the site, were suggested. Some of the potential alternatives advocated by the community include activity related to renewable energy, agriculture, entertainment, tourism, and residential uses.

Some of the alternative uses proposed by the public are not viable alternatives due to restrictions associated with the site. A study of existing conditions at the site found constraints related to its proximity to the airport that make it inappropriate for noise-sensitive uses, such as residential development. Restrictions on assembly related to airport proximity also limited other uses, such as an entertainment space, that were favored by the public.

Three potential activities that are compatible with the realities of the site, align with regional industry cluster activity, and are supported by the public were selected to provide the basis for the development of alternative scenarios for the reuse of the property. These are:

Fulfillment: the process of receiving, packaging, and shipping orders for goods

Manufacturing: the making of goods or wares by manual labor or machinery, especially on a large scale

Innovation: research or other activity supporting advancements in technology, the sciences, and other disciplines

Alternative land use scenarios were developed that would support these uses under different assumptions regarding parking ratios and whether existing structures would be retained or demolished. A fiscal analysis determined that each of the project scenarios designed in this process would create a positive net fiscal impact for the City, in addition to the positive economic impact of added employment.

NEXT STEPS

Although Boeing retains ownership of the C-17 site, the City will continue to work proactively to ensure that the facilities are reused or redeveloped in a manner that is consistent with the primary mission of the C-17 Transition Program: to address both the short-term needs of the dislocated workers and the long-term economic development needs of the region. The City will continue to take steps to refine and implement this plan in order to realize the best possible reuse of the C-17 site for the residents of Long Beach.

SECTION I - INTRODUCTION

Chapter 1

Project Background

In December 2015, Boeing Corporation closed the C-17 Globemaster final assembly facility in Long Beach, California. The C-17 Globemaster, a large airlifter designed for military transport, was developed for the United States Air Force and has been in production at the Boeing facility in Long Beach since the first aircraft was completed in 1991. The closure followed a statement released by Boeing in September 2013 that the company had completed their contract with the US Air Force and would discontinue production of the C-17 aircraft. Citing uncertainty related to sequestration in the United States and the contracting budgets of other C-17 customers, which include several foreign air forces around the world, Boeing officials announced that the facility would produce only 22 more aircraft. Slightly over two years later, the final airlifter took flight from the production facility in November 2015, marking the official conclusion of C-17 assembly in Long Beach.

The closure of the C-17 site has significant implications for the City of Long Beach, the surrounding region, and related industry in Southern California and beyond. At the time that Boeing announced it would discontinue production of the C-17 in 2013, the Long Beach final assembly facility employed approximately 2,200 individuals. Phased layoffs up to the plant's closure in December 2015 resulted in the dislocation of approximately 1,600 workers. Beyond this direct impact, it is estimated that an additional workforce reduction of 3,800 positions could be felt in peripheral service industries like health care and retail due to ripple effects related to the Boeing closure, according to a recent study by EMSI.

In addition to the economic implications of the layoffs, it is anticipated that the conclusion of C-17 production in Long Beach will result in negative externalities for Boeing's regional network of suppliers. Aerospace related industries, such as the manufacturing of aircraft, aircraft parts, and auxiliary equipment, are highly

concentrated in the Long Beach region relative to the national average. Reduced demand along regional supply chains related to the end of C-17 production could result in further contraction in these industries, magnifying the impact of the Boeing closure in and around Long Beach.

Finally, Boeing's closure of the C-17 facility leaves vacant a distinctive site which includes a 1.1 million square foot enclosed production space directly adjacent to Long Beach Airport. These attributes increase the appeal of the site to users that require direct runway access or space for manufacturing or warehousing. The size and positioning of the facility creates a unique opportunity for the City of Long Beach to strengthen the region's industry clusters by attracting a high volume of compatible economic activity to the site.

C-17 TRANSITION PROGRAM

To address these impacts, the City of Long Beach (the City) was awarded a grant from the United States Department of Defense (DoD) Office of Economic Adjustment (OEA) to design and implement the C-17 Transition Program (the Program), a comprehensive response to the Boeing facility closure that addresses both the short-term needs of the dislocated workers and the long-term economic development needs of the region. The Program is managed by the Pacific Gateway Workforce Investment Network (PGWIN), which functions as the City's Workforce Development Bureau, and was developed in conjunction with City staff representing several departments including the Office of the City Manager, the Economic Development Department, and the Planning Bureau of the Department of Development Services.

Additionally, Program activities are guided by the C-17 Public Steering Committee (the Committee). The Committee is populated by the Pacific Gateway Workforce Development Board, which includes leaders of the community representing a diverse group of employers, educators, and labor groups. The key roles and responsibilities of the Committee include reviewing the individual components of the Plan and contributing to public engagement to guide the overall direction of the Program effort.

The C-17 Transition Program is organized into three key tracks: Economic Development Planning; Land Use and Infrastructure Planning; and Assistance to Impacted Defense Firms and Workers. The goals of each track are summarized below:

Track	Description of Goals
Track 1: Economic Development Planning	To adjust effectively to impacts related to the Boeing facility closure and identify opportunities to advance the site, the supply chain, and the regional cluster.
Track 2: Land Use and Infrastructure Planning	To assess the existing conditions of the Boeing C-17 facilities (i.e. public infrastructure) and develop conceptual reuses with the goal of ensuring compatibility with future economic development strategies.
Track 3: Assistance to Impacted Defense Firms and Workers	To establish a Boeing and defense dislocated worker case management tracking platform that incorporates customized training modules and provides direct assistance to impacted suppliers.

PUBLIC ENGAGEMENT

Public engagement is a vital component of each of the three tracks of the C-17 Transition Program discussed above. Specifically, the community provided valuable input throughout all phases of the development of the Plan through participation in a series of three charrettes organized by the City and led by City staff and members of the consultant team. Outreach for these charrettes was directed at employers, community, members, and other key stakeholders and was conducted online and via direct mailing. These charrettes provided the City with an opportunity to garner support from the public for the mission of the C-17 Transition Program, as well as to collect their feedback at various critical stages of the project. Hosted in July, August, and September 2016, the charrettes addressed the following topics:

Charrette Date	Topics Addressed
July 19, 2016	At this charrette, the consultant team presented initial findings of the Economic Development Planning research that had taken place as a component of Track 1 of the C-17 Transition Program. This included an analysis of economic and demographic trends, a profile of growing occupational groups and industries, and a mapping of regional industry clusters. Following this presentation, attendees participated in a facilitated dialogue that allowed the City to develop an understanding of the public's perception of the health of the local economy, as well as their priorities for the future of the C-17 site.
July 23, 2016	The consultant team provided an overview of the qualities of the C-17 project site, the existing conditions, and the relevant airport compatibility constraints that may restrict potential reuses. Attendees were then divided into small groups and asked to participate in a workshop to discuss their desired outcomes for the site's future use or redevelopment. This input was considered in conjunction with the findings of the Economic Development Planning track to identify a set of preferred land use alternatives for further exploration. Additional information on the specific outcomes of this charrette is located in Chapter 8 of this document.
July 12, 2016	This charrette focused on a series of preferred land use alternatives derived in part from the input provided by the public at the previous meeting in August. Participants received a presentation that outlined the specifications of several alternatives, as well as an assessment of potential fiscal impacts. Following this presentation, participants had the opportunity to ask questions or make comments.

Each of these presentations can be found online by visiting www.pacific-gateway.org/c-17. The contributions from the public at each charrette became key components of this document, the *C-17 Transition Master Plan*.

C-17 TRANSITION MASTER PLAN

The *C-17 Transition Master Plan* (the Plan), is a key initial outcome of the overall C-17 Transition Program and contains a summary of the processes and outcomes of the economic development and land use and infrastructure planning that the City has undertaken to date. The City's ultimate goal in developing and implementing the Plan is to promote economic opportunities in Long Beach by identifying strategies that

will expand the C-17 facility's potential reuse and make the activities hosted there more resilient to fluctuations in Defense-related spending.

The C-17 Transition Master Plan is organized into four sections as follows:

Section Title	Description
Section I **Introduction**	This section functions as an introduction by providing an overview of the C-17 Transition Program and an outline of the Plan.
Section II **Economic Development Planning**	Successful economic development planning requires a data-informed understanding of the dynamic elements of local and regional economies, including the characteristics of the workforce and the comparative strength of the existing industries and clusters. Developing this understanding was the first step undertaken by the City in designing the Plan. The studies presented in this section provide the foundation for the strategies outlined in this document, which will ultimately guide the City's approach to the redevelopment of the C-17 site and the advancement of the economic interests of Long Beach and the surrounding communities.
Section III **Land Use and Infrastructure Planning**	Land Use and Infrastructure Planning: This section presents a summary of the existing conditions of the C-17 facility and presents an assessment of a set of proposed land use alternatives for the reuse of the site. These alternatives were developed in conjunction with the public with the ultimate goal of promoting job creation and regional economic growth.
Section IV **Next Steps**	This section discusses the City's intentions with respect to the C-17 Transition Master Plan and related Program activities moving forward.

Although Boeing currently retains ownership of the site, the C-17 Transition Program and Master Plan allow the City to respond proactively to the closure by addressing the immediate needs of impacted firms and workers while developing strategies to promote the economic development of Long Beach and the surrounding region through the reuse or redevelopment of the Boeing site.

Section II – Economic Development Planning

Chapter 2

Workforce Trends & Employment Opportunities

This chapter provides an overview of the trends generating employment opportunities in Long Beach. This information is valuable not only to dislocated workers who may be seeking to transition into expanding industries, but also to the City as it seeks to promote redevelopment of the C-17 site that maximizes economic opportunity in Long Beach and the surrounding region. Recognizing that economic activity does not necessarily conform to political jurisdictions or geographic boundaries, this analysis includes the neighboring community of Signal Hill.

For a similar analysis conducted across the broader region, including cities in South Bay, Southeast Los Angeles County, and nearby cities in Orange County, please see the *Pacific Gateway Workforce Investment Network Economic and Demographic Analysis* online at: www.pacific-gateway.org/c17.

EMPLOYMENT

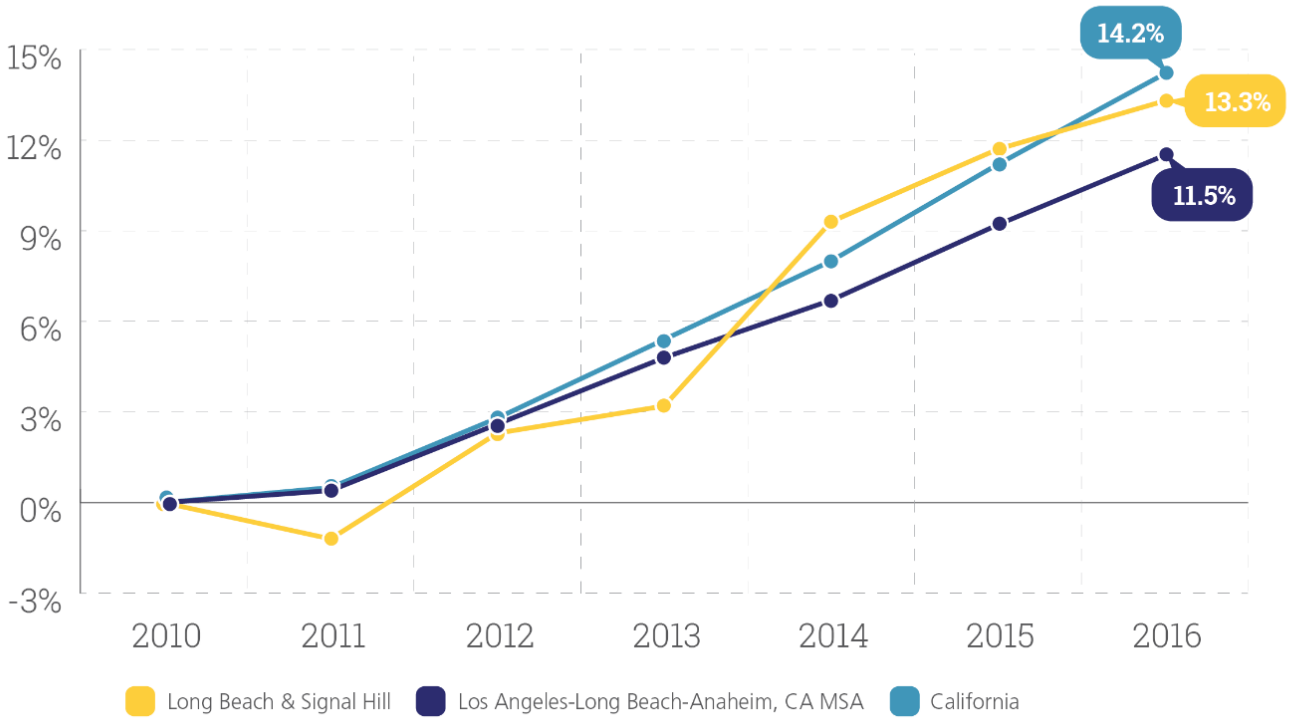
By the second quarter of 2016, Long Beach and Signal Hill (211,000 jobs) trailed just behind California as a whole in overall job growth since the second quarter of 2010 (13.3% vs. 14.2%). Since the mid-stages of 2010, Long Beach and Signal Hill have outpaced the greater Los Angeles-Long Beach-Anaheim, CA MSA in growth by 1.8 percentage points (13.3% to 11.5%), adding just over 24,700 jobs. Figure 1 below reflects the percentile change in overall employment from 2010 to 2015 for comparison regions.

The following figure (Figure 2) displays the unemployment level of all Long Beach and Signal Hill residents versus those throughout California. The unemployment rate in the Long Beach and Signal Hill region fell to 5.7% in June 2016, equaling that of California. In January 2010, the unemployment rate for Long Beach and Signal Hill residents was 13.9%, nearly two and a half times the June 2016 rate. The labor force participation rate in Long Beach and Signal Hill in 2014 was 66.5%, higher than that of California (63.4%).[1]

REGIONAL EMPLOYMENT BY INDUSTRY

Several traditional industries have undergone strong growth in Long Beach and Signal Hill since 2010, with Accommodation and Food Services outpacing them all at 70.8% growth. This is much higher than the growth rate of Accommodation and Food Services in the larger regional MSA and California. Healthcare growth in Long Beach and Signal Hill has trended behind the industry's growth in the MSA (22.8% vs. 37.8%) and California as a whole (22.8% vs. 34.8%) (Figure 3). Agriculture, Manufacturing, and Information in Long Beach and Signal Hill have fewer total jobs in 2016 when compared to 2010 (Figure 4).

Figure 1: Overall Change in Employment from 2010 to 2015 (Region)



[1] Source: American Community Survey (ACS) 2014 5-year estimates

Figure 2: Long Beach and Signal Hill Historic Unemployment Rate (Jan 2010 to Jun 2016)[2]

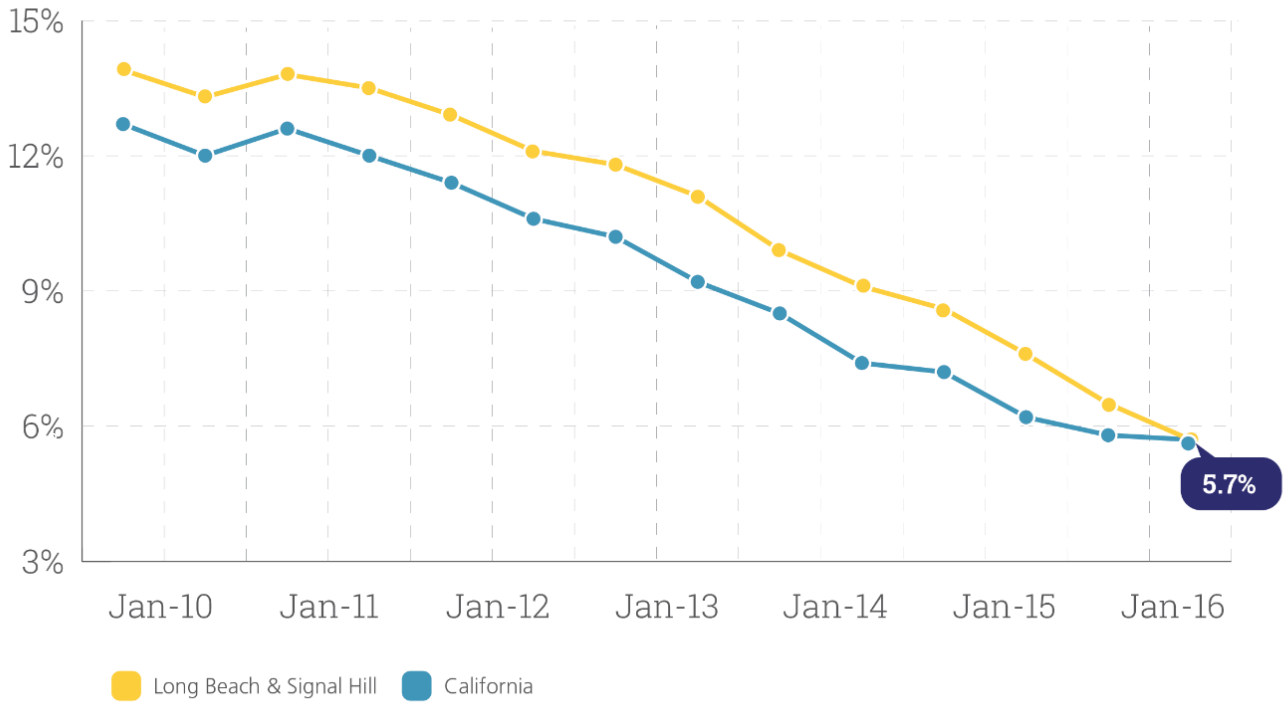
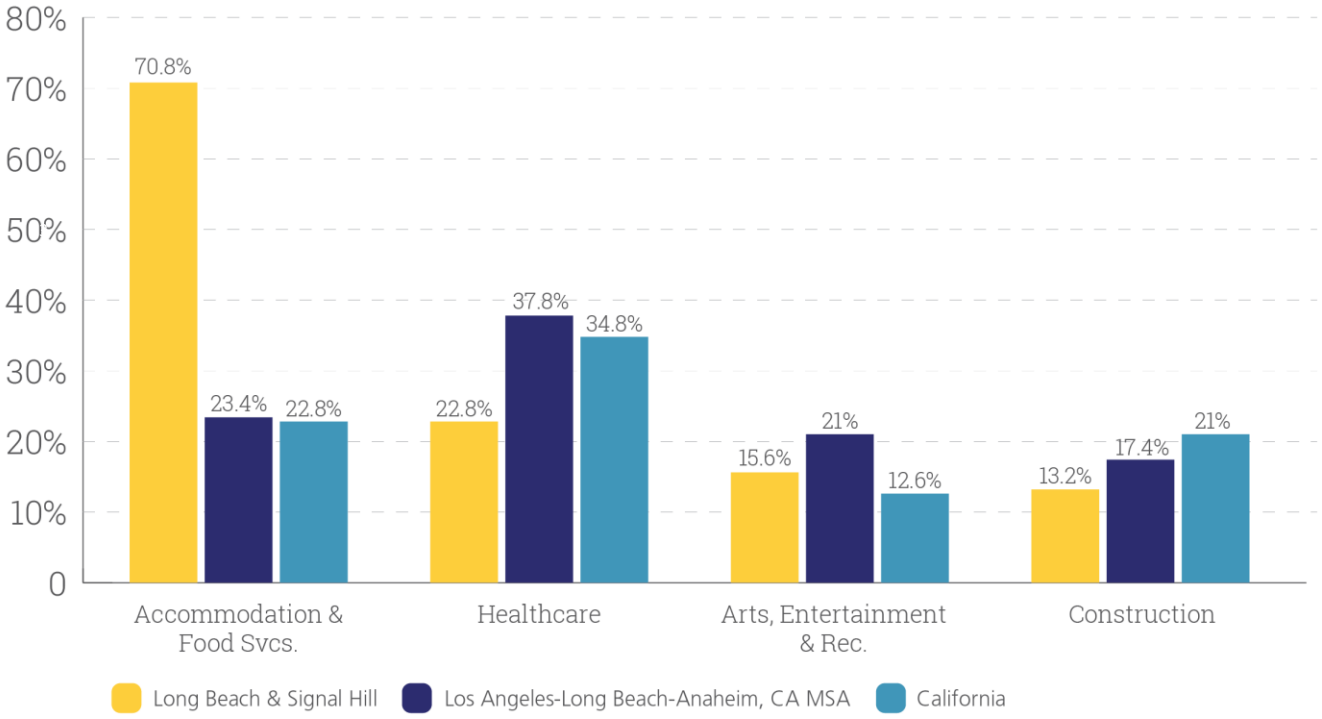
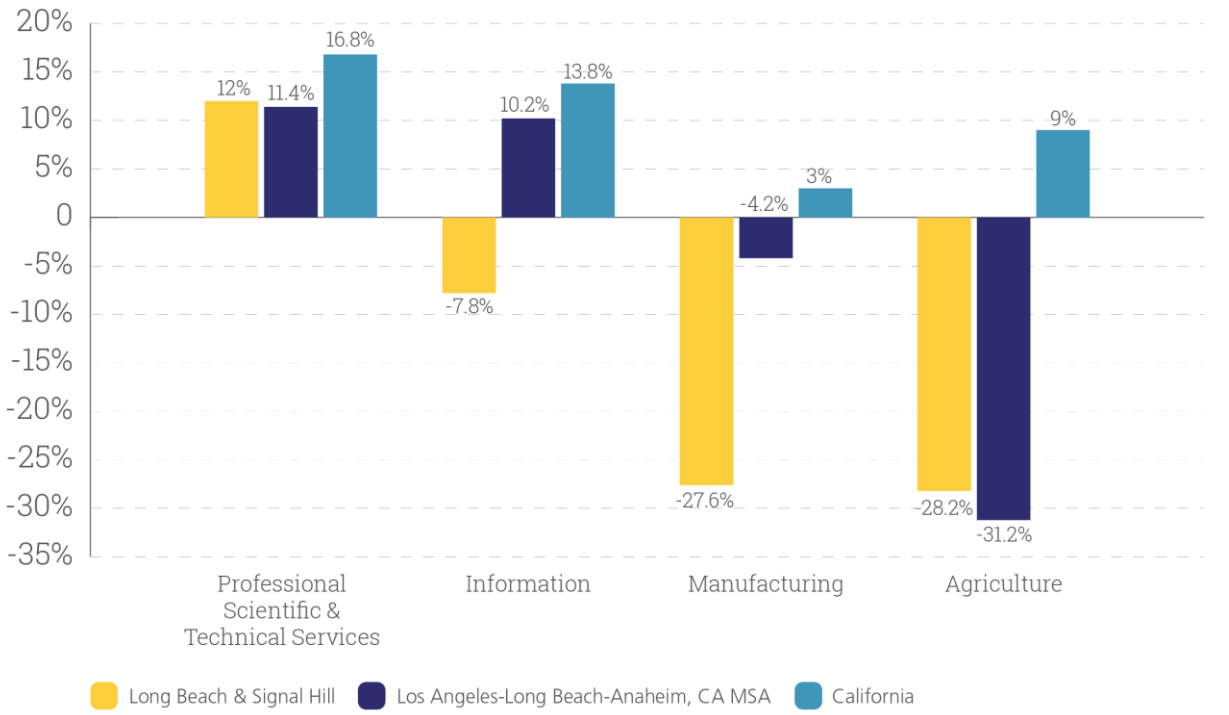


Figure 3: Industry Change in Employment by Region from 2010 to 2016[3]



[2] Source: Employment Development Department (EDD)
[3] Source: JobsEQ 2016 Q2 Complete Employment

Figure 4: Industry Change in Employment by Region from 2010 to 2016 (2)[4]



LONG BEACH AND SIGNAL HILL OCCUPATIONAL PROFILE

The unemployment rate, the number of jobs created, the number of people employed, and the size of the workforce are all important indicators to consider. However, these data points also mask some critical information, starting with the reality **that not all jobs are equal**. An entry-level job that pays minimum-wage with limited training and on-the-job skill development is considerably less valuable than a high-paying, full-time position with full benefits that continually develops and trains an individual for increasing levels of responsibility.

A recent study by David Autor examined changes in the nation's occupational profile. Autor provided an in-depth examination of the quality and quantity of the jobs that employers have demanded over the last 30 years. In his analysis, Autor developed an occupational segmentation that BW Research has also used in regional occupational analyses. This occupational segmentation technique delineates all occupations into one of three tiers. The occupational tiers are broadly defined as follows:

Tier 1 Occupations include managers (Chief Executives, Financial Managers, and Sales Managers), professional positions (Lawyers, Accountants, and Physicians) and highly-skilled technical occupations, such as scientists, computer programmers, and engineers. These occupations are typically the highest-paying, highest-skilled occupations in the economy. In 2015, the average wage for Tier 1 occupations in Long Beach and Signal Hill was $49.18 an hour or approximately $102,300 a year (assuming a 40-hour work week for the entire year).

Tier 2 Occupations include sales positions (Sales Representatives), teachers, and librarians, office and administrative positions (Accounting Clerks and Secretaries), and manufacturing, operations, and production positions (Assemblers, Electricians, and Machinists). These occupations have historically provided the majority of employment opportunities and could be referred to as middle-wage, middle-skill

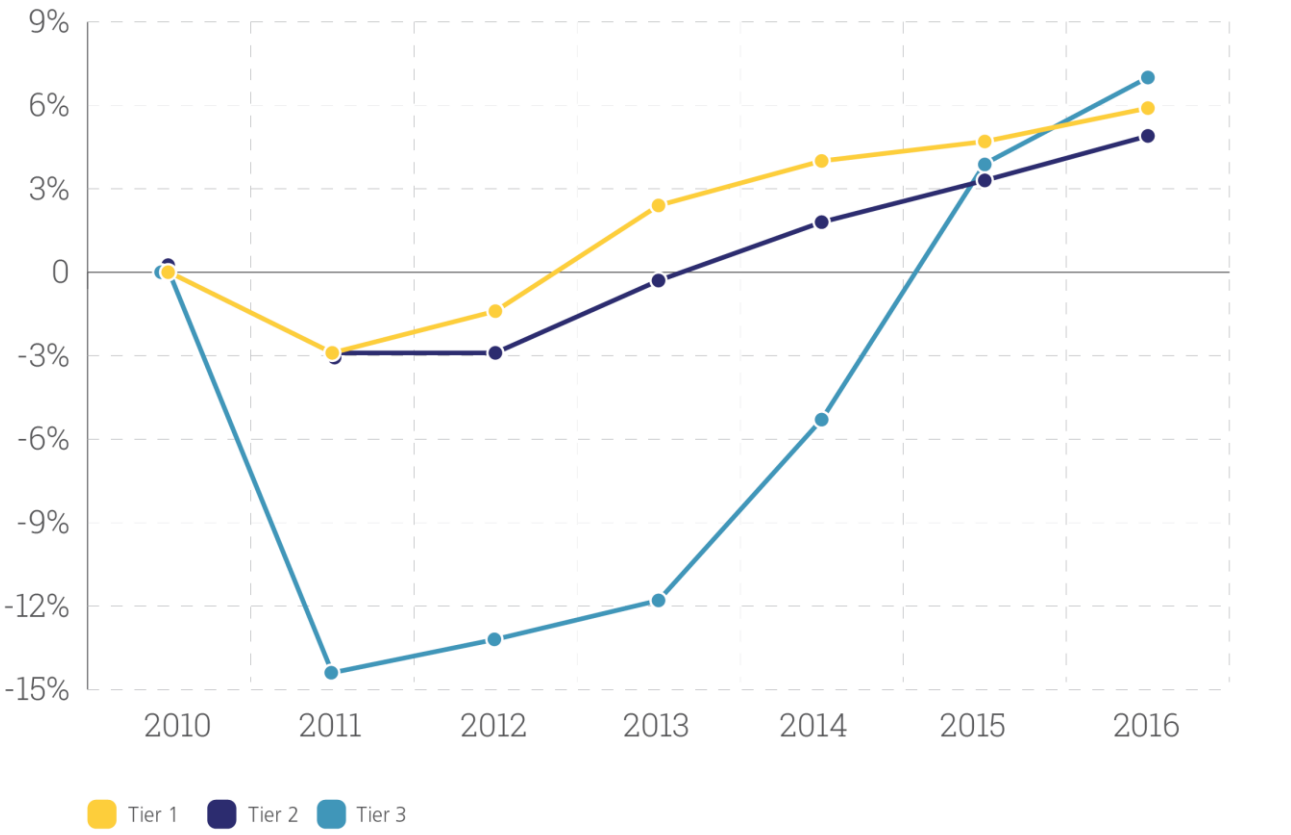
[4] Source: JobsEQ 2016 Q2 Complete Employment

positions. In 2015, the average wage for Tier 2 occupations in Long Beach and Signal Hill was $23.89 an hour or approximately $49,700 a year (assuming a 40-hour work week for the entire year).

Tier 3 Occupations include protective services (Security Guards), food service and retail positions (Waiters, Cooks, and Cashiers), building and grounds cleaning positions (Janitors), and personal care positions (Home Health Aides and Child Care Workers). These occupations typically represent lower-skilled service positions with lower wages that require little formal training and/or education. In 2015, the average wage for Tier 3 occupations in Long Beach and Signal Hill was $12.84 an hour or approximately $26,700 a year (assuming a 40-hour work week for the entire year).

As Figure 5 illustrates, occupational tiers have experienced similar overall rates of growth since 2010. Tier 3 occupations have fared slightly better than Tier 1 or Tier 2 occupations, despite losing a large amount of employment between 2010 and 2011. Since the beginning of the economic recovery in 2010, Tier 3 jobs expanded by 7%, while Tier 1 jobs increased by 6% and Tier 2 jobs grew by 5%.

Figure 5: Percentage Change in Long Beach and Signal Hill Occupational Tier Employment from 2010 to 2016[5]

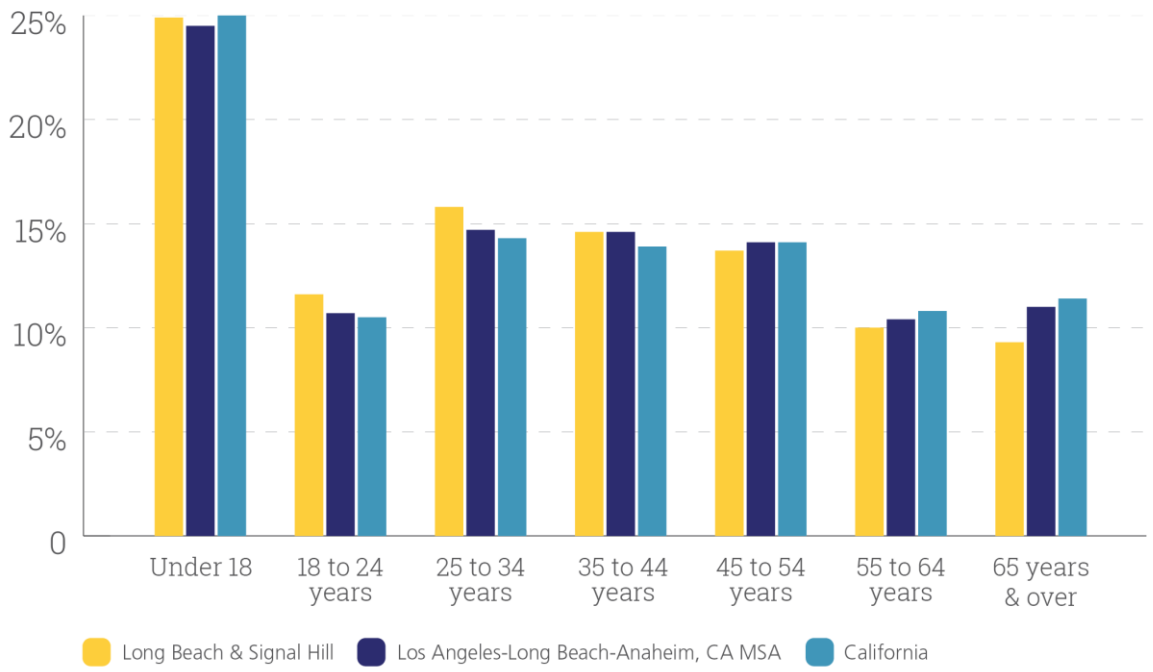


POPULATION AND WORKFORCE

The total population in the Long Beach and Signal Hill area was 483,026 people in 2015, representing 38% of the Los Angeles-Long Beach-Anaheim, CA MSA. Approximately a quarter of the population in Long Beach and Signal Hill was 18 or younger in 2015, matching the proportion in California as a whole. Just over 19% of Long Beach and Signal Hill residents was 55 or older in 2015, this is compared to just over 21% for the larger regional MSA and 22% in California (Figure 6).

[5] Source: JobsEQ 2016 Q2 Complete Employment

Figure 6: Age Distribution by Region (2015)[6]



The Long Beach and Signal Hill area is home to a lower proportion of residents possessing a bachelor's degree or more (29%) when compared to the larger MSA (32%) and California as whole (32%) (Figure 7).

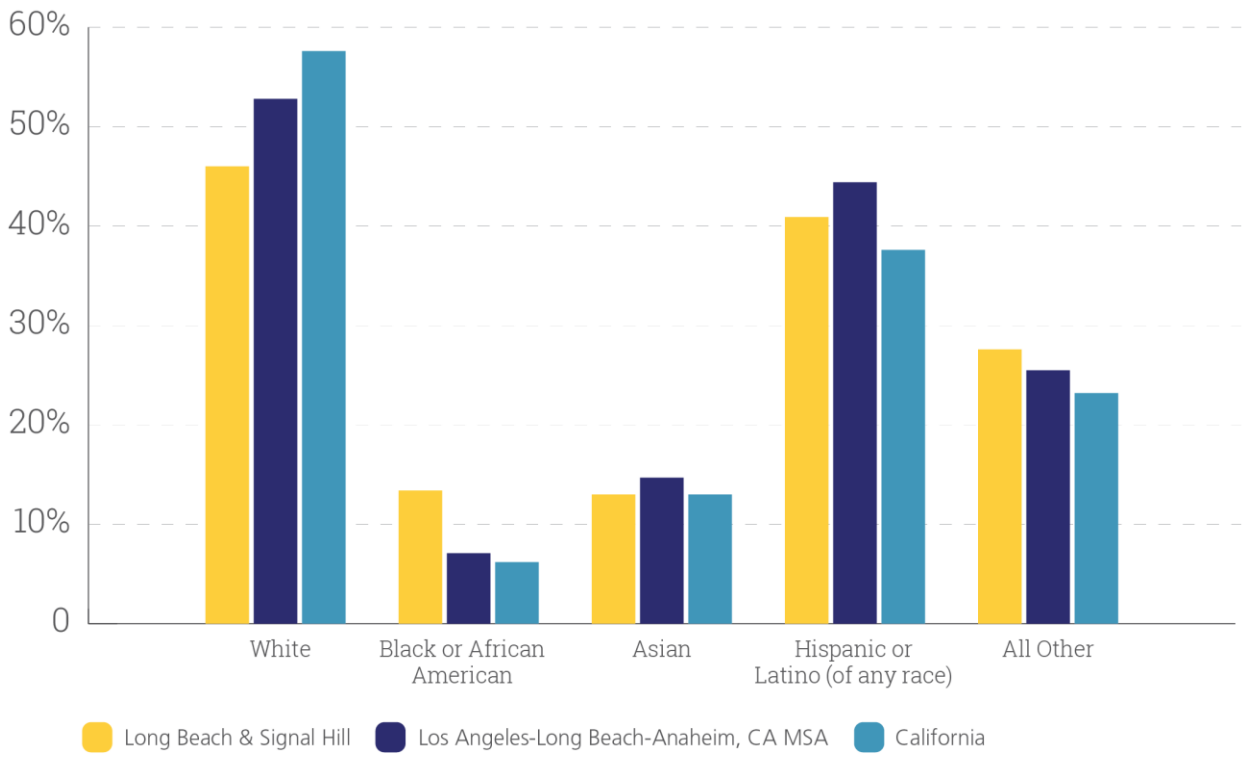
Figure 7: Educational Attainment for the Population 25 Years and Older by Region (2015)[7]

[6] Source: JobsEQ 2016 Q2 Complete Employment
[7] Source: JobsEQ 2016 Q2 Complete Employment

The Long Beach and Signal Hill area is home to a lower median household income ($56,832) in comparison to the Los Angeles-Long Beach-Anaheim, CA MSA ($60,377), and the state of California ($61,489). Approximately one-fifth of all residents in Long Beach and Signal Hill are living below the federal poverty level (Los Angeles-Long Beach-Anaheim, CA MSA: 17% and California: 16%) and just over one-tenth of households (11%) are receiving food stamps (Los Angeles-Long Beach-Anaheim, CA MSA: 8% and California: 9%).[8]

Figure 8 illustrates the breakdown of the population by ethnicity for Long Beach and Signal Hill, the Los Angeles-Long Beach-Anaheim, CA MSA and California.[9]

Figure 8: Ethnicity by Region (2015)[7]



EDUCATION

The number of STEM completions at Long Beach and Signal Hill's postsecondary institutions represented 1.7% of all STEM completions in California during the 2014-2015 school year. Long Beach and Signal Hill STEM completions totaled 1,632 total awards (includes certificates and 2-year awards, 4-year awards, and postgraduate awards).

WORKFORCE

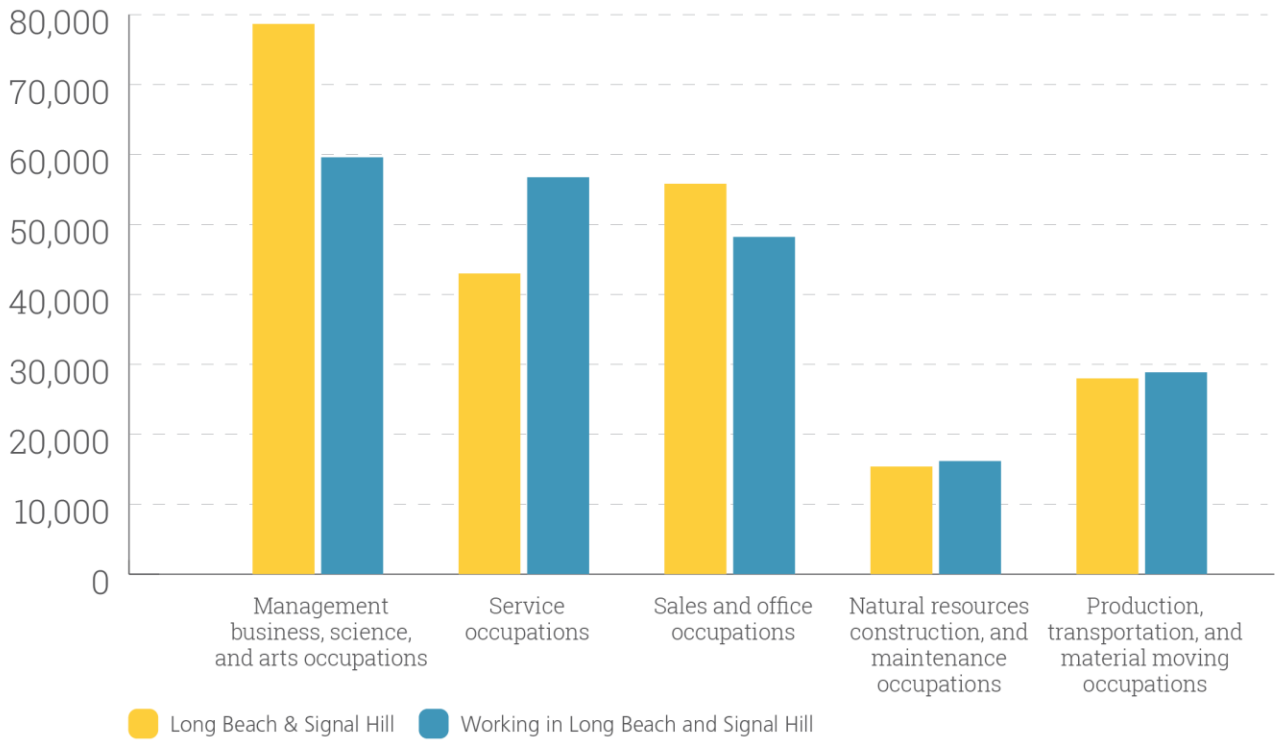
There are several ways of examining how the region's residents are prepared to work for regional employers. One way is to compare how residents of Long Beach and Signal Hill in the labor force (identified

[8] Source: JobsEQ 2016 Q2 Complete Employment
[9] The percentages of White, Black or African American, Asian, and All Other sum to 100%. These ethnicities are combined categories that include Hispanic and non-Hispanic individuals.
[10] Source: JobsEQ 2016 Q2 Complete Employment

as the resident workforce) and those working or employed in Long Beach and Signal Hill (regardless of where they live) look in terms of the general occupational categories and skills that they provide.

Long Beach and Signal Hill has a larger resident workforce than the total amount of workers employed in the region (resident workforce: 220,800; employed in the region: 209,600). As in previous years, the largest gaps between the resident workforce and those employed in the region are found in management, business, science, and arts occupations and service occupations. This signifies that Long Beach and Signal Hill is generally an exporter of higher-skilled workers, such as those in management, business, science, and arts occupations, and an importer of lower-skilled workers, such as those in service and production, transportation, and material moving occupations.

Figure 9: Resident Workforce vs. Working in the Region by Occupations[11]



HOUSING AND TRANSPORTATION TRENDS

The affordability of housing and the accessibility of transportation both play a major role in determining the radius within which the workforce is able to connect with potential employers. These paragraphs discuss trends in these indicators in Long Beach and Signal Hill.

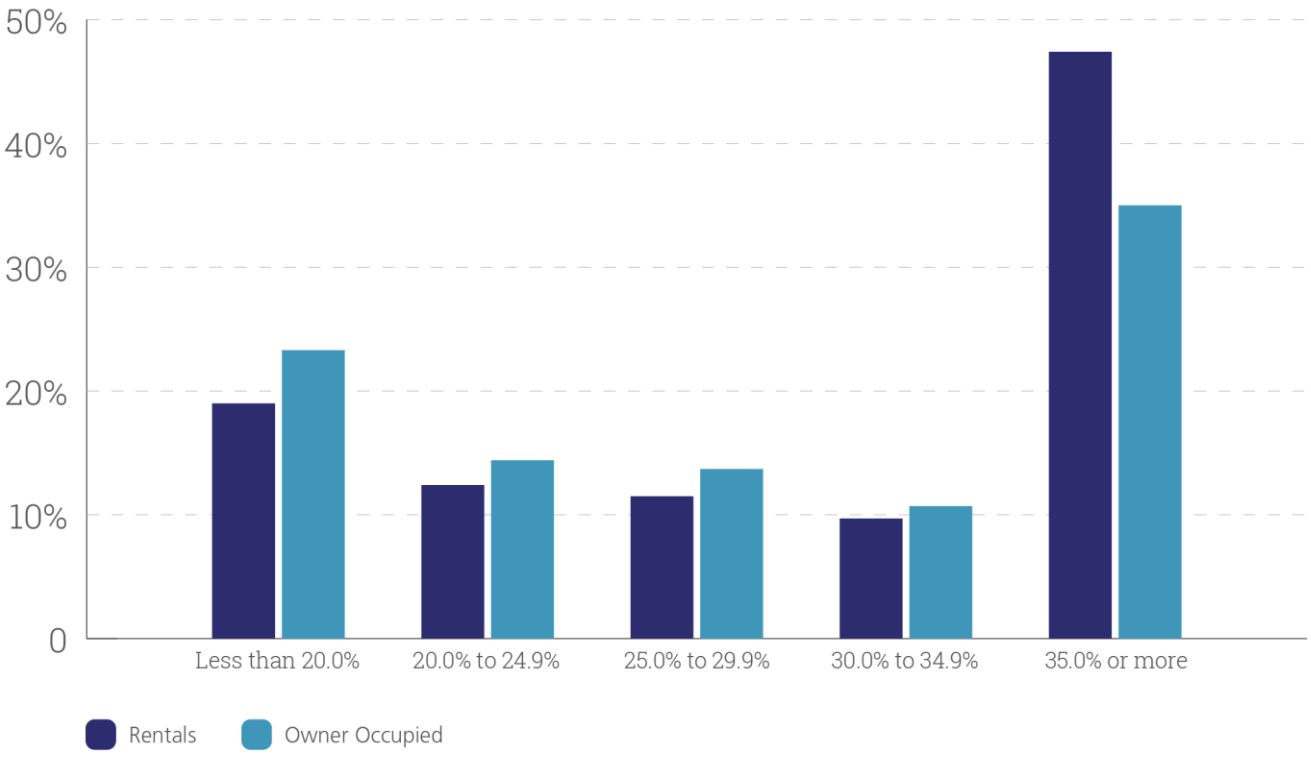
HOUSING

Thirty-five percent of home owners with a mortgage and nearly half of renters (47%) allocated over a third of their household earnings to housing in 2014. Nearly two-thirds (65%) of all households in Long Beach and Signal Hill were renters in 2014.

[11] Source: American Community Survey (ACS) 2014 5-year estimates & JobsEQ

There is a negative side to the relatively high cost of housing in Long Beach and Signal Hill besides the cost itself; medium to low wage earners will more likely to live further away from the locations in which they work, contributing to higher traffic volume and congestion (a scenario that is playing out currently in Silicon Valley[12]). Those that pay more for housing will have less for other essentials such as food, clothing, utilities, health care, etc. Furthermore, high costs are detrimental to first-time home buyers or those medium to low wage earners looking to move to the region for work.

Figure 10: Gross Housing Costs as a Percentage of Household Income (2014)[13]



TRANSPORTATION

Nearly 194,000 workers aged 16 or over utilized a vehicle to travel to work in the Long Beach and Signal Hill in 2014 (Figure 11). [14]

- Car, truck, or van – drove alone: 157,900
- Car, truck, or van – carpooled: 20,648
- Public transportation (excluding taxicab): 15,281

Forty-five percent of all commuters 16 years of age and older in Long Beach and Signal Hill spent at least 30 minutes or more getting to work in 2014 (Figure 12).

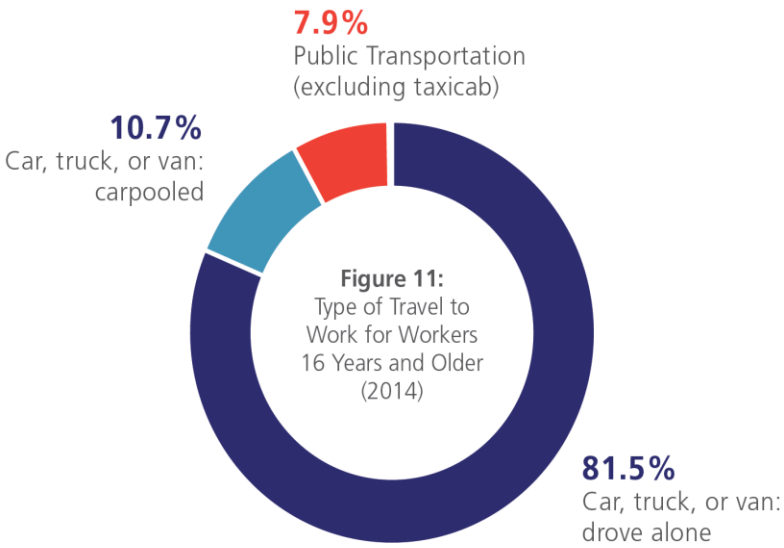
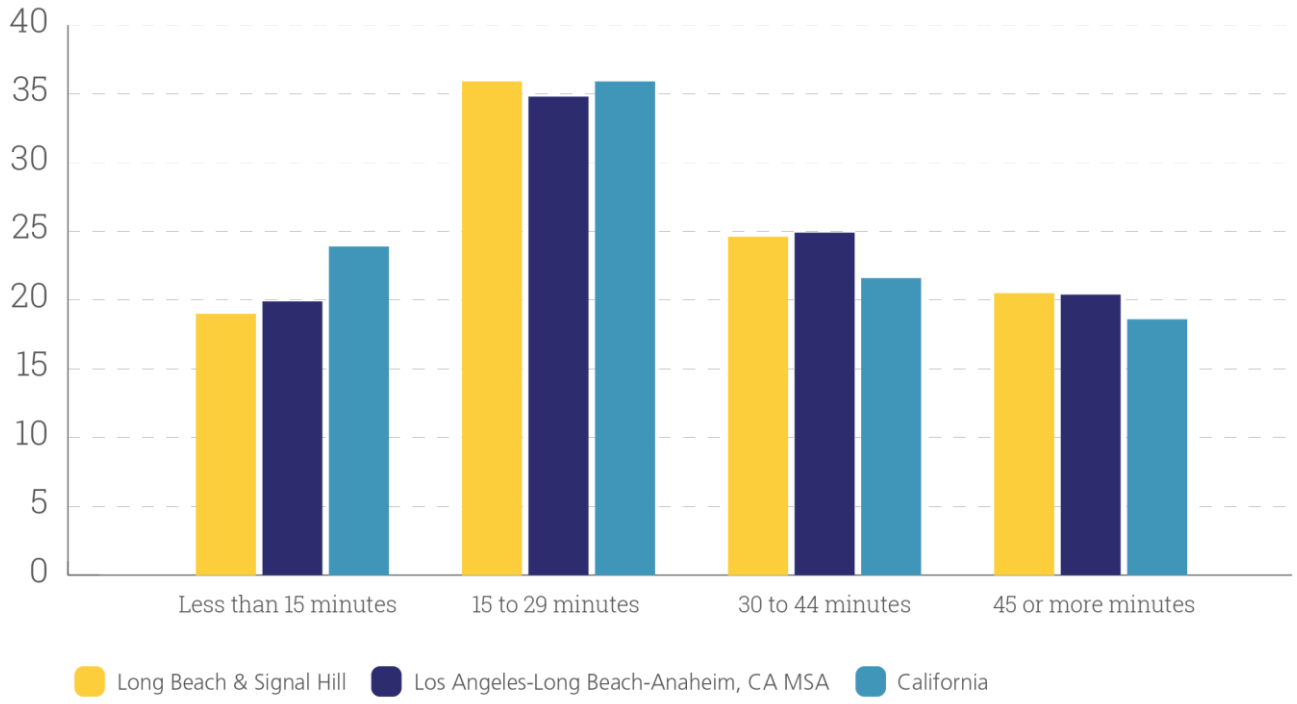


Figure 11: Type of Travel to Work for Workers 16 Years and Older (2014)

[12] See: http://sanfrancisco.cbslocal.com/2016/02/16/study-bay-area-cant-keep-up-with-job-income-growth-in-silicon-valley/
[13] Source: American Community Survey (ACS) 2014 5-year estimates
[14] Source: American Community Survey (ACS) 2014 5-year estimates

Figure 12: Travel Time to Work for Workers 16 Years and Older by Region (2014)



CONCLUSION

This chapter has presented a profile of the workforce in Long Beach and Signal Hill and summarized the opportunities available to them in the region. Overall, Long Beach continues to generate job growth in industries spanning the spectrum of occupational segmentation, from high-paying, high-skilled Tier 1 jobs to less desirable Tier 3 jobs. Despite this, the workforce continues to face challenges, including lower median household income than is present in the broader Los Angeles-Long Beach-Anaheim MSA and in California as a whole.

The next chapter will transition the focus from job growth within individual industries in Long Beach and Signal Hill to consider growth across larger industry clusters present in the Los Angeles-Long Beach-Anaheim MSA. This will provide a broader sense of industry sectors present in the Long Beach region that will drive economic growth and the expansion of employment opportunity in the future.

Chapter 3

Cluster Mapping Analysis

Industry clusters are groups of similar and related firms with interconnected operations (via competition or collaboration) within a defined region or geographic area. Cluster mapping analysis segments the economy to promote a deeper understanding of its changing landscape with respect to the labor market. Understanding which clusters are likely to be sources of employment opportunity in the future allows the City to engage employers at the center of this economic growth and create skill and career pathway development programs to align the regional workforce to the needs of growing industry clusters. Promoting the strength of these industry clusters is critical, as they account for approximately one-third of the employment in the region and about half of the employment growth, creating positions that typically pay above average wages. Additionally, investing in strategies to promote the development of strong clusters will enhance the competitiveness of the region and increase its ability to attract innovative companies, creating additional job opportunities.

This chapter discusses several of the major clusters present in Long Beach and the Los Angeles-Long Beach-Anaheim, CA Metropolitan Statistical Area (MSA), including Defense, Transportation, & Related Manufacturing, the cluster most impacted by the closure of the C-17 manufacturing facility.

IDENTIFIED CLUSTERS

Below is a brief description of the industry clusters that were examined for the Los Angeles-Long Beach-Anaheim, CA MSA. The industry clusters were identified based on numerous factors, including;

- Total employment
- Average annual wages of workers
- Growth potential (based on past growth 2010-2016)
- Occupational composition (high-skill, medium-skill, low-skill)

The industry clusters contain a mix of export-oriented and population serving industry clusters. These clusters represent 32% of all employment within the MSA. The following table provides a summary of the clusters discussed in this chapter. All data can be attributed to EMSI 2016.1 Complete Employment or Chmura Economics JobsEQ 2015 Total Employment.[15]

Table 1: Identified Clusters and Descriptions

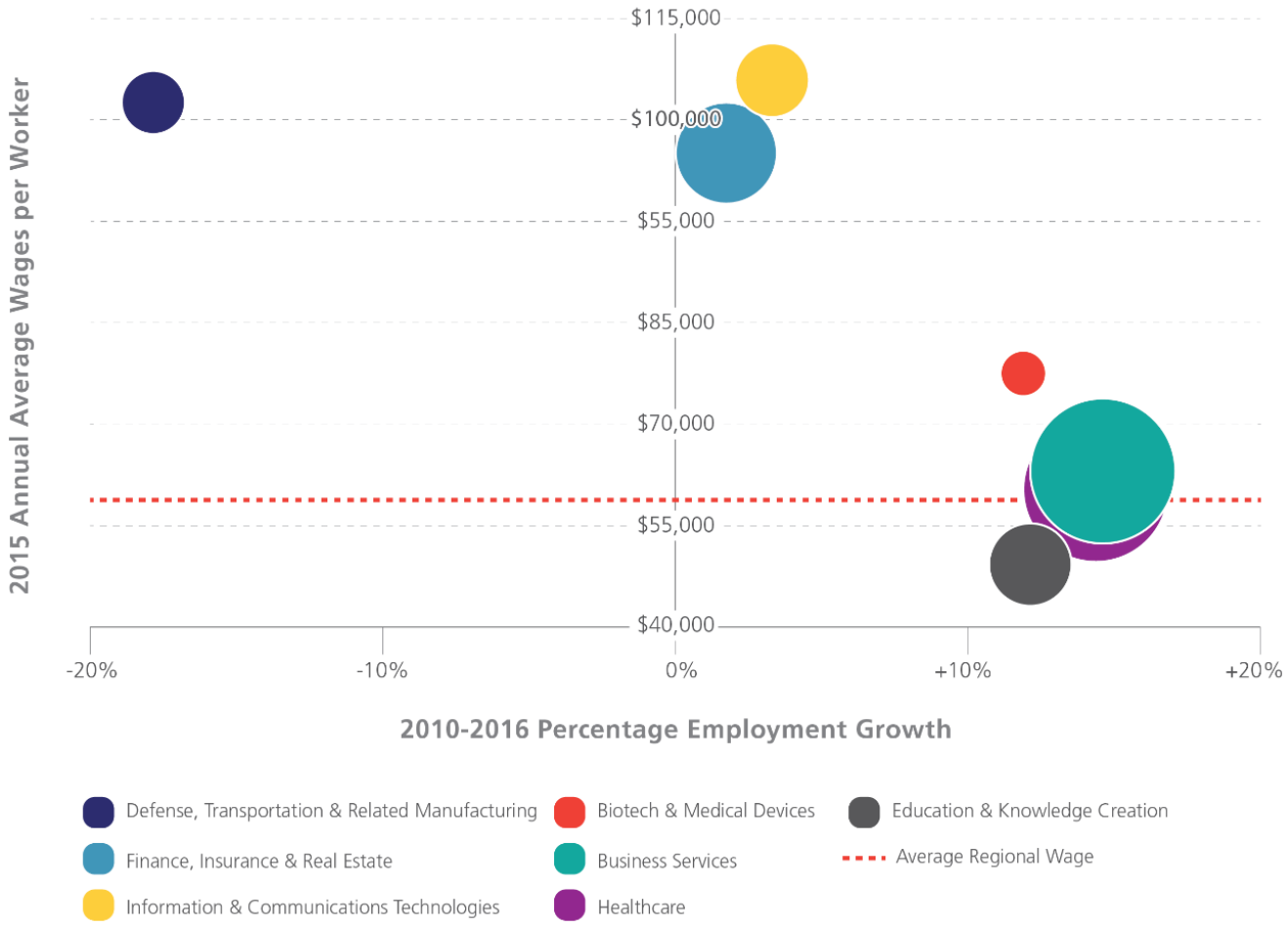
Cluster	Description
Healthcare	Includes the diagnosis, treatment, and prevention of disease, illness, injury, and other physical and mental impairments. Healthcare is delivered by a wide range of practitioners in medicine, chiropractic, dentistry, nursing, pharmacy, etc. This industry cluster includes ambulatory care services, hospitals, and residential care facilities. Healthcare employs **592,217 workers** (3.6% of all cluster jobs located in Long Beach) in 2016 with an **average annual wage of $58,058** ($57,728 in Long Beach). The cluster has expanded employment by over 86,100 workers since 2010 (17% growth).
Business Services	Consists of supportive service industries for businesses in the region (advertising agencies, tax preparation services, public relations agencies, human resources consulting services, etc.). This cluster employs **576,027 workers** (2.1% of all cluster jobs located in Long Beach) and has an **average annual wage of $60,919** ($64,490 in Long Beach). The industry cluster increased employment by nearly 18% since 2010, or approximately 86,600 more workers.
Finance, Insurance & Real Estate	Includes the commercial banks, credit unions, consumer lending agencies, securities brokerages, insurance services, and offices of real estate agents and brokers, etc. As of the first quarter of 2016, the cluster employs **310,931 workers** (2.3% of all cluster jobs located in Long Beach) at an **average annual wage of $96,372** ($85,093 in Long Beach). This cluster has added over 10,000 since 2016 at a growth rate of just over 3%.
Education & Knowledge Creation	Includes schools (primary, secondary, tertiary) and information industries (publishers of newspapers, periodicals, internet publishing, etc.) and employs **196,666 workers** (1.2% of all cluster jobs located in Long Beach) across the MSA with an **average annual wage of $48,100** ($45,119 in Long Beach). With just over 12% growth since 2010, the cluster has added over 21,700 workers in the MSA region since 2010.

[15] Source: https://w.economicmodeling.com & jobseq.com

Information & Communications Technologies (ICT)	ICT is a diverse group of technology industries that focus on the development and production of new products and services in telecommunications and information technology in the region. Some of the sectors in this cluster include telecommunications carriers, software publishers, cyber security developers, and computer and electronic product manufacturing. ICT employs **127,056 workers** (2.0% of all cluster jobs located in Long Beach) with an **average annual wage of $106,887** ($106,006 in Long Beach). The cluster has added nearly 7,600 workers since 2010 (6% growth).
Information & Communications Technology & Design	This sub-cluster includes software publishers, satellite telecommunications, computer design services, etc. Information, Technology and Design employs the majority of the parent ICT cluster (**103,569 workers** or 82% of ICT) with an **average annual wage of $104,259** per worker. The sub-cluster added approximately 8,700 workers between 2010 and 2016 (9% growth).
Information & Communications Technology Manufacturing	This sub-cluster includes computer manufacturing, communications equipment manufacturing, semiconductor manufacturing, etc. The ICT sub-cluster represents **23,487 workers** in the MSA region at an **average annual wage of $117,906**. The manufacturing sub-cluster experienced a loss of over 1,100 jobs since the beginning of 2010, or a -5% growth rate.
Defense, Transportation, & Related Manufacturing	Includes aerospace manufacturing, motor vehicle manufacturing, and other production activities related to transportation. This cluster employs **74,339 workers** (10.4% of all cluster jobs located in Long Beach) in 2016 and had workers make an **average annual wage of $100,853** ($108,488 in Long Beach). This manufacturing cluster has experienced significant job losses since 2010, shedding over 15,100 jobs (-17% growth).
Biotech and Medical Devices	Includes the research, development, and production of medical equipment and pharmaceuticals and employs **60,787 workers** (1.4% of all cluster jobs located in Long Beach) that earn an **average annual wage of $76,746** ($69,076 in Long Beach). Biotech and Medical Devices experienced strong growth from 2010 to 2016, adding nearly 7,400 jobs (a growth rate of 14%).
Testing, Research, & Development in Biotechnology	This sub-cluster includes the research and development and testing elements related to biotechnology. The sub-cluster employs 17% of the larger Biotech and Medical Devices industry cluster (**10,308 workers**) and workers earn an **average annual wage of $72,631**. Since 2010 the sub-cluster has grown 16% (1,400 added workers)
Biotech & Medical Devices Production & Manufacturing	This sub-cluster includes pharmaceutical manufacturing, surgical appliance manufacturing, electromedical and electrotherapeutic apparatus manufacturing, etc. The production and manufacturing of biotech and medical devices employs **50,479 workers** in the Los Angeles-Long Beach-Anaheim, CA MSA region at an **average annual wage of $77,576**. Biotech & Medical Devices Production & Manufacturing increased employment by nearly 6,000 workers between 2010 and 2016 (13% growth).

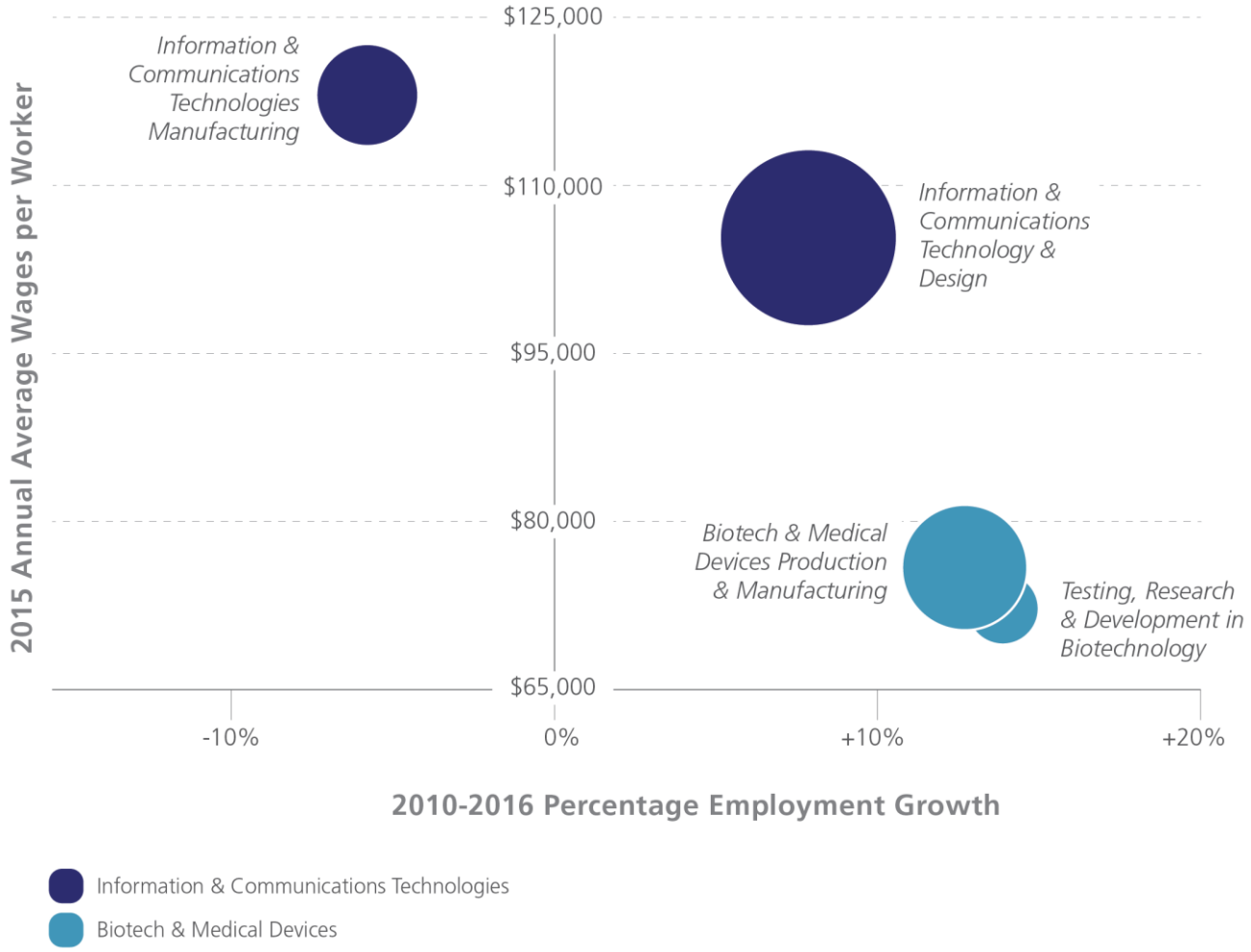
Figure 1 displays the relative size of employment (2016 estimates) in each industry cluster within the Los Angeles-Long Beach-Anaheim, CA MSA (by the size of the sphere), the average annual wages per worker within the region (2015), and the overall employment growth or decline from 2010 to 2016. Six of the seven industry clusters experience overall employment growth (over 3% each) over the last six years and five of those had annual average wages that were above the MSA average in 2015 ($56,890). Information and Communications Technologies paid its workers the most among industry clusters on average in 2015 ($106,887), followed by Defense, Transportation and Related Manufacturing ($100,853), and Finance, Insurance and Real Estate ($96,372).

Figure 1: Los Angeles-Long Beach-Anaheim, CA MSA Industry Clusters

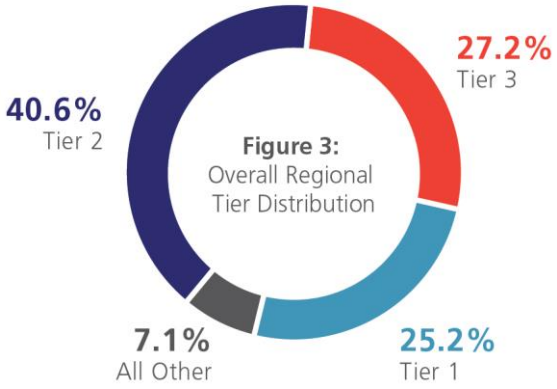


The following figure (Figure 2) splits out the Information and Communications Technologies (ICT) and Biotech and Medical Devices industry clusters into their relevant sub-segments. Biotech & Medical Devices Production & Manufacturing has undergone healthy growth in the Los Angeles-Long Beach-Anaheim, CA MSA since 2010 (13% growth), unlike its counterparts in Information & Communications Technologies Manufacturing (-5% growth) and Defense, Transportation & Related Manufacturing (-17% growth) (Figure 1).

Figure 2: Information & Communications Technologies and Biotech & Medical Devices Industry Sub-Clusters



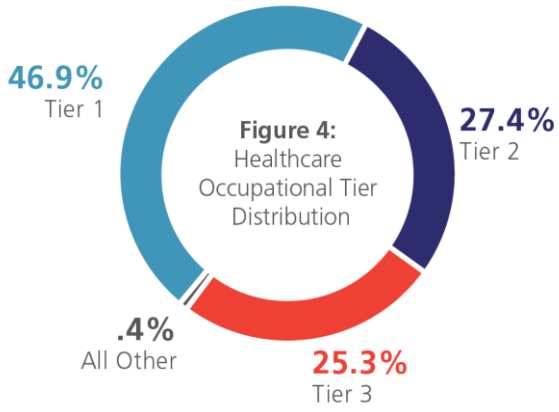
OCCUPATIONAL LANDSCAPE



The following section breaks down the occupational composition of the selected industry clusters by occupational tier and lists the top ten growth occupations over the last six years (since the beginning of the economic recovery). Figure 3 to the left provides the overall regional tier distribution. The majority of jobs available in the industry clusters discussed are in high- to middle-skilled occupations (Tiers 1 and 2). The broad definitions of each occupational tier is provided below:

- **Tier 1 Occupations** include managers (Chief Executives, Financial Managers, and Sales Managers), professional positions (Lawyers, Accountants, and Physicians) and highly-skilled technical occupations, such as scientists, computer programmers, and engineers. These occupations are typically the highest-paying, highest-skilled occupations in the economy. Tier 1 occupations currently occupy approximately 25% of all positions in the Los Angeles-Long Beach-Anaheim, CA MSA.
- **Tier 2 Occupations** include sales positions (Sales Representatives), teachers, and librarians, office and administrative positions (Accounting Clerks and Secretaries), and manufacturing, operations, and production positions (Assemblers, Electricians, and Machinists). These occupations have historically provided the majority of employment opportunities and could be referred to as middle-wage, middle-skill positions. Just under 41% of all workers in the MSA region are employed in Tier 2 occupations
- **Tier 3 Occupations** include protective services (Security Guards), food service and retail positions (Waiters, Cooks, and Cashiers), building and grounds cleaning positions (Janitors), and personal care positions (Home Health Aides and Child Care Workers). These occupations typically represent lower-skilled service positions with lower wages that require little formal training and/or education. Just over 27% of all occupations in the MSA region are classified as Tier 3 occupations.

HEALTHCARE



The Healthcare industry cluster has a significantly higher concentration of Tier 1 workers when compared to the MSA region as a whole (47% vs. 25%). Just over a quarter of workers are employed in middle-skill, middle-wage positons (Tier 2) within the cluster, a smaller share when weighed against the regional number (41%).The proportion of Tier 3 occupations within Healthcare is the highest when compared to other selected industry clusters, but on par with the region as a whole.

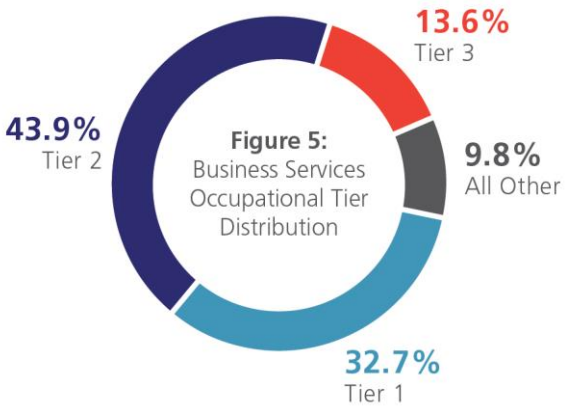
The largest amount of employment for Tier 1 and Tier 2 jobs is located in the following detailed occupational categories;

- **Tier 1** – Registered Nurses (77,903 workers), Licensed Practical and Licensed Vocational Nurses (23,485 workers), Medical and Health Services Managers (8,780 workers), Physicians and Surgeons (8,656 workers), and Dental Hygienists (7,639 workers).

- **Tier 2** – Medical Secretaries (27,680 workers), Receptionists and Information Clerks (17,863 workers), Office Clerks (14,285 workers), Supervisors of Office and Administrative Support Workers (11,160 workers), and Billing and Posting Clerks (10,457 workers).

Table 2 lists the top ten growth occupations for the Healthcare industry cluster by total growth over the last six years. Registered Nurses, Nursing Assistants, Medical Secretaries, and Medical Assistants increased total employment levels by over 5,000 workers each from 2010 to 2016.

BUSINESS SERVICES



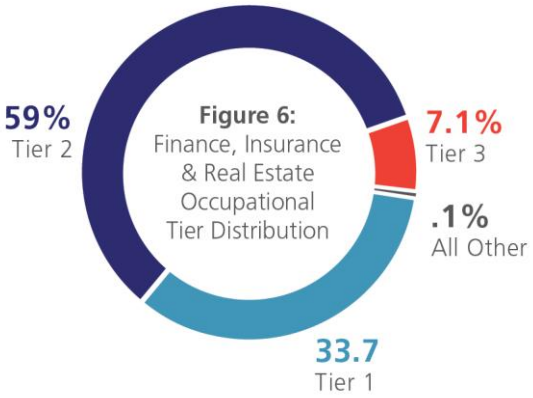
Proportionally, the Business Services industry cluster employs a similar amount of Tier 2 workers as the wider MSA region. The concentration of Tier 1 occupations within the cluster is higher when compared to the region as whole (33% vs. 25%) while the percentage of Tier 3 employment is markedly less for Business Services compared to the overall regional economy (14% vs. 27%). Nearly one-tenth of employment exists in occupations that are either transitional or do not adhere to tier definition metrics.

The largest amount of employment for Tier 1 and Tier 2 jobs is located in the following detailed occupational categories;

- **Tier 1** – Accountants and Auditors (26,962 workers), Lawyers (23,660 workers), General and Operations Managers (12,252 workers), Paralegals and Legal Assistants (10,227 workers), Management Analysts (9,484 workers), and Market Research Analysts and Marketing Specialists (7,430 workers).
- **Tier 2** – Office Clerks (22,247 workers), Customer Service Representatives (17,477 workers), Bookkeeping, Accounting, and Auditing Clerks (12,934 workers), Legal Secretaries (12,582 workers), and Secretaries and Administrative Assistants (except legal, medical, and executive) (12,186 workers).

Laborers and Freight, Stock, and Material Movers (hand) was the highest growth occupation in the Business Services cluster from 2010 to 2016, adding nearly 7,900 jobs over the six-year time period. The remaining occupations listed in Table 3 each increased by over 2,000 workers between 2010 and 2016.

FINANCE, INSURANCE & REAL ESTATE



The majority of employment in the Finance, Insurance & Real Estate industry cluster is located in Tier 2 jobs (59%). The proportion of Tier 2 jobs in the cluster is nearly 20 percentage points higher when compared to the Los Angeles-Long Beach-Anaheim industry as a whole (41%). Just over a third of workers within the cluster are employed in high-skill, high-wage (Tier 1) positions (34%) and 7% work in Tier 3 occupations.

The largest amount of employment for Tier 1 and Tier 2 jobs is located in the following detailed occupational categories;

- **Tier 1** – Loan Officers (12,656 workers), Property, Real Estate, and Community Association Managers (9,645 workers), Personal Financial Advisors (9,220 workers, Claims Adjusters, Examiners, and Investigators (6,846 workers), and Financial Managers (6,805 workers).
- **Tier 2** – Insurance Sales Agents (24,982 workers), Tellers (17,328 workers), Customer Service Representatives (15,040 workers), Securities, Commodities, and Financial Services Sales Agents (14,821 workers), and Maintenance and Repair Workers (12,415 workers).

Five occupations of the top ten listed in Table 4 employed within the Finance, Insurance and Real Estate industry cluster added over 1,000 jobs since the beginning of the financial recovery (2010);

- Insurance Sales Agents added 2,987 workers
- Personal Financial Advisors added 1,584 workers
- Maintenance and Repair Workers added 1,335 workers
- Real Estate Sales Agents added 1,177 workers
- Counter and Rental Clerks added 1,121 workers

EDUCATION & KNOWLEDGE CREATION

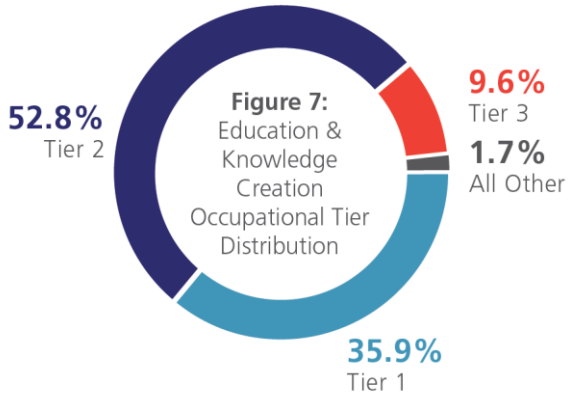


Figure 7: Education & Knowledge Creation Occupational Tier Distribution

Over half of all workers employed in the Education and Knowledge Creation industry cluster are classified as Tier 2 employees (53%), which is higher compared to the overall industry measure in the MSA region (41%). The proportion of Tier 1 employment in the industry cluster is also higher than the overall regional proportion (36% vs. 25%). Nearly 10% of all employment sits in low-skill, low-wage jobs (Tier 3). Just under 2% of employment exists in occupations that are either transitional or do not adhere to tier definition metrics.

The largest amount of employment for Tier 1 and Tier 2 jobs is located in the following occupational categories;

- **Tier 1** – Postsecondary Education Teachers (23,304 workers), Coaches and Scouts (4,766 workers), General and Operations Managers (2,773 workers), Postsecondary Education Administrators (2,463 workers), and Business Operations Specialists (2,177).
- **Tier 2** – Office Clerks (9,295 workers), Secretaries and Administrative Assistants, (except legal, medical, and executive) (8,943 workers), Teachers and Instructors (all other) (8,833 workers), Elementary School Teachers (7,480 workers), and Teacher Assistants (7,260 workers).

Table 5 displays the top ten occupations in the Education and Knowledge Creation industry cluster by total growth from 2010 to 2016. Five occupations experienced the addition of more than 1,000 total jobs in the six-year time period;

- Postsecondary Teachers added 1,613 workers
- Teachers and Instructors (all other) added 1,493 workers
- Self-Enrichment Education Teachers added 1,172 workers
- Office Clerks added 1,139 workers
- Teacher Assistants added 1,098 workers

INFORMATION & COMMUNICATIONS TECHNOLOGIES (ICT)

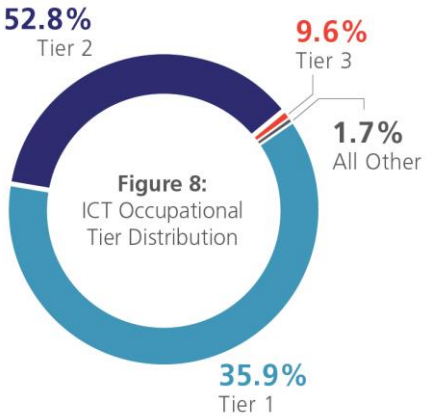


Figure 8: ICT Occupational Tier Distribution

Information and Communications Technologies has the highest proportion of Tier 1 occupational employment among the clusters identified in the Los Angeles-Long Beach-Anaheim, CA MSA region (62%). Nearly all of the remaining employment in the Information and Communications Technologies cluster is located in Tier 2 occupations (37%), which is a slightly lower share when compared to the overall industry proportion in the region (41%).

The largest amount of employment for Tier 1 and Tier 2 jobs is located in the following detailed occupational categories;

- **Tier 1** – Software Developers (applications) (10,396 workers), Software developers (systems software) (6,613 workers), Computer User Support Specialists (5,430 workers), Computer Programmers (5,280 workers), and Computer Systems Analysts (4,890 workers).
- **Tier 2** – Telecommunications Equipment Installers and Repairers (except line installers) (6,604 workers), Sales Representatives (services) (6,168 workers), Customer Service Representatives (5,021 workers), Electrical and Electronic Equipment Assemblers (2,357 workers), and Telecommunications Line Installers and Repairers (2,472 workers).

Software Developers (applications) (1,808 added workers) and Software Developers (systems software) (1,073 added workers) were the only occupational categories of the top ten listed in Table 6 to increase employment numbers by over 1,000 additional workers from 2010 to 2016 for the Information and Communications Technologies (ICT) industry cluster in the MSA region.

DEFENSE, TRANSPORTATION & RELATED MANUFACTURING

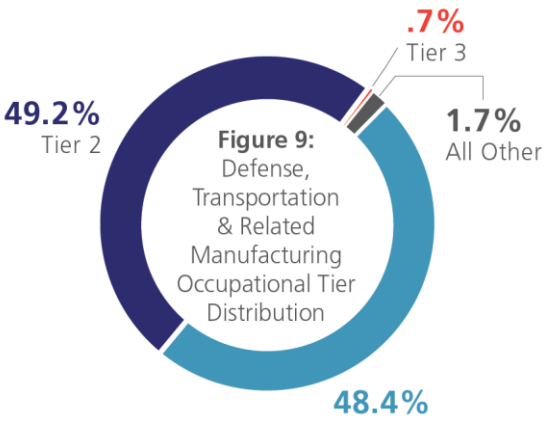


Figure 9: Defense, Transportation & Related Manufacturing Occupational Tier Distribution

Nearly all employment is split evenly between Tier 1 (48%) and Tier 2 (49%) within Defense, Transportation and Related Manufacturing in the Los Angeles-Long Beach-Anaheim, CA MSA region. The remaining employment in the cluster sits within the Tier 3 occupational classification (1%), or exists in occupations that are either transitional or do not adhere to tier definition metrics.

The largest amount of employment for Tier 1 and Tier 2 jobs is located in the following detailed occupational categories;

- **Tier 1** – Aerospace Engineers (3,525 workers), Industrial Engineers (2,587 workers), Software Developers (systems software) (2,358 workers), Mechanical Engineers (1,985 workers), and Purchasing Agents (1,547 workers).
- **Tier 2** – Team Assemblers (3,991 workers), Inspectors, Testers, Sorters, Samplers, and Weighers (2,964 workers), Machinists (2,326 workers), Electrical and Electronic Equipment Assemblers (1,855 workers), and Supervisors of Production and Operating Workers (1,652 workers).

The Defense, Transportation and Related Manufacturing industry cluster is the only identified cluster to contract in total employment from 2010 to 2016. Of the top ten occupations listed in Table 7, only Aircraft Structure, Surfaces, Rigging, and Systems Assemblers added 100 or more employees in the six-year time period.

BIOTECH & MEDICAL DEVICES

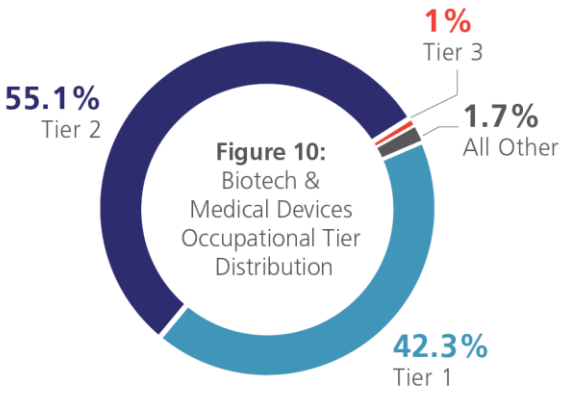


Figure 10: Biotech & Medical Devices Occupational Tier Distribution

Middle-skill, middle-wage (Tier 2) workers represent the majority of workers in the Biotech and Medical Devices industry cluster in the MSA region. Over 42% of employment in the cluster is within Tier 1 occupations, with only 1% of total employment categorized as low-skill, low-wage (Tier 3).

The largest amount of employment for Tier 1 and Tier 2 jobs is located in the following detailed occupational categories;

- **Tier 1** – General and Operations Managers (1,329 workers), Chemists (1,255 workers), Industrial Engineers (1,133 workers), Biomedical Engineers (1,057 workers), and Architectural and Engineering Managers (822 workers).
- **Tier 2** – Team Assemblers (4,226 workers), Inspectors, Testers, Sorters, Samplers, and Weighers (2,649 workers), Dental Laboratory Technicians (1,766 workers), Supervisors of Production and Operating Workers (1,497 workers), and Packaging and Filling Machine Operators and Tenders (1,080 workers).

Team Assemblers (840 added workers), Inspectors, Testers, Sorters, Samplers, and Weighers (386 added workers), and Biomedical Engineers (345 added workers) increased employment by over 300 workers over the last six years (2010 to 2016) within the Biotech and Medical Devices industry cluster. The remaining occupations in Table 8 grew by more than 100 employees each in the same time period.

The following pages contain the tables referenced in the summaries above.

Table 1: Healthcare Highest Growth Occupations from 2010 to 2016

Description	Tier	Change (2010 - 2016)	% Change (2010 - 2016)	% of Total Jobs in Industry Group (2015)	Median Hourly Earnings	Typical Entry Level Education	Work Experience Required	Typical On-The-Job Training
Registered Nurses	1	9,094	12.9%	13.5%	$ 45.04	Associate's degree	None	None
Nursing Assistants	3	5,542	19.7%	5.6%	$ 13.33	Postsecondary non-degree award	None	None
Medical Secretaries	2	5,289	23.6%	4.7%	$ 17.02	High school diploma or equivalent	None	Moderate-term on-the-job training
Medical Assistants	3	5,249	20.7%	5.2%	$ 15.65	Postsecondary non-degree award	None	None
Licensed Practical and Licensed Vocational Nurses	1	4,538	24.0%	3.9%	$ 24.00	Postsecondary non-degree award	None	None
Receptionists and Information Clerks	2	2,984	20.1%	3.0%	$ 13.84	High school diploma or equivalent	None	Short-term on-the-job training
Dental Assistants	3	2,202	14.7%	2.9%	$ 17.01	Postsecondary non-degree award	None	None
First-Line Supervisors of Office and Administrative Support Workers	2	1,764	18.8%	1.9%	$ 27.22	High school diploma or equivalent	Less than 5 years	None
Billing and Posting Clerks	2	1,638	18.6%	1.8%	$ 17.43	High school diploma or equivalent	None	Short-term on-the-job training
Maids and Housekeeping Cleaners	3	1,371	19.4%	1.4%	$ 11.33	Less than high school	None	Short-term on-the-job training

Table 2: Business Services Highest Growth Occupations from 2010 to 2016

Description	Tier	Change (2010 - 2016)	% Change (2010 - 2016)	% of Total Jobs in Industry Group (2015)	Median Hourly Earnings	Typical Entry Level Education	Work Experience Required	Typical On-The-Job Training
Laborers and Freight, Stock, and Material Movers, Hand	3	7,856	34.6%	5.3%	$11.66	Less than high school	None	Short-term on-the-job training
Accountants and Auditors	1	3,739	16.1%	4.6%	$33.54	Bachelor's degree	None	None
Customer Service Representatives	2	2,827	19.3%	3.0%	$17.31	High school diploma or equivalent	None	Short-term on-the-job training
Packers and Packagers, Hand	3	2,777	37.3%	1.8%	$9.99	Less than high school	None	Short-term on-the-job training
Janitors and Cleaners, Except Maids and Housekeeping Cleaners	3	2,755	9.0%	5.7%	$11.74	Less than high school	None	Short-term on-the-job training
Office Clerks, General	2	2,579	13.1%	3.9%	$14.69	High school diploma or equivalent	None	Short-term on-the-job training
Team Assemblers	2	2,477	32.5%	1.7%	$12.14	High school diploma or equivalent	None	Moderate-term on-the-job training
Management Analysts	1	2,333	32.6%	1.6%	$40.78	Bachelor's degree	Less than 5 years	None
Helpers--Production Workers	3	2,182	38.5%	1.4%	$11.03	Less than high school	None	Short-term on-the-job training
Market Research Analysts and Marketing Specialists	1	2,040	37.8%	1.3%	$31.07	Bachelor's degree	None	None

Table 3: Finance, Insurance & Real Estate Highest Growth Occupations from 2010 to 2016

Description	Tier	Change (2010 - 2016)	% Change (2010 - 2016)	% of Total Jobs in Industry Group (2015)	Median Hourly Earnings	Typical Entry Level Education	Work Experience Required	Typical On-The-Job Training
Insurance Sales Agents	2	2,987	13.6%	8.0%	$ 26.01	High school diploma or equivalent	None	Moderate-term on-the-job training
Personal Financial Advisors	1	1,584	20.7%	2.9%	$ 41.76	Bachelor's degree	None	None
Maintenance and Repair Workers, General	2	1,335	12.0%	3.9%	$ 18.71	High school diploma or equivalent	None	Long-term on-the-job training
Real Estate Sales Agents	2	1,177	14.6%	2.9%	$ 24.19	High school diploma or equivalent	None	Long-term on-the-job training
Counter and Rental Clerks	3	1,121	13.7%	3.0%	$ 11.98	Less than high school	None	Short-term on-the-job training
Property, Real Estate, and Community Association Managers	1	985	11.4%	3.1%	$ 30.48	High school diploma or equivalent	Less than 5 years	None
Secretaries and Administrative Assistants, Except Legal, Medical, and Executive	2	848	11.0%	2.7%	$ 17.91	High school diploma or equivalent	None	Short-term on-the-job training
Office Clerks, General	2	569	5.3%	3.7%	$ 14.69	High school diploma or equivalent	None	Short-term on-the-job training
Real Estate Brokers	2	463	17.0%	1.0%	$ 35.81	High school diploma or equivalent	Less than 5 years	None
Janitors and Cleaners, Except Maids and Housekeeping Cleaners	3	450	11.6%	1.4%	$ 11.74	Less than high school	None	Short-term on-the-job training

Table 4: Education & Knowledge Creation Highest Growth Occupations from 2010 to 2016

Description	Tier	Change (2010 - 2016)	% Change (2010 - 2016)	% of Total Jobs in Industry Group (2015)	Median Hourly Earnings	Typical Entry Level Education	Work Experience Required	Typical On-The-Job Training
Postsecondary Teachers	1	1,613	7.4%	11.7%	$ 36.68	Doctoral or professional degree	None	None
Teachers and Instructors, All Other	2	1,493	20.3%	4.5%	$ 22.16	Bachelor's degree	None	Internship/residency
Self-Enrichment Education Teachers	2	1,172	24.4%	3.0%	$ 16.63	High school diploma or equivalent	Less than 5 years	None
Office Clerks, General	2	1,139	14.0%	4.7%	$ 14.69	High school diploma or equivalent	None	Short-term on-the-job training
Teacher Assistants	2	1,098	17.8%	3.7%	$ 14.57	Some college, no degree	None	None
Elementary School Teachers, Except Special Education	2	990	15.3%	3.8%	$ 35.81	Bachelor's degree	None	Internship/residency
Secretaries and Administrative Assistants, Except Legal, Medical, and Executive	2	981	12.3%	4.6%	$ 17.91	High school diploma or equivalent	None	Short-term on-the-job training
Janitors and Cleaners, Except Maids and Housekeeping Cleaners	3	981	22.2%	2.7%	$ 11.74	Less than high school	None	Short-term on-the-job training
Coaches and Scouts	1	900	23.3%	2.4%	$ 19.96	Bachelor's degree	None	None
Secondary School Teachers, Except Special and Career/Technical Education	2	858	14.6%	3.4%	$ 36.04	Bachelor's degree	None	Internship/residency

Table 5: ICT Highest Growth Occupations from 2010 to 2016

Description	Tier	Change (2010 - 2016)	% Change (2010 - 2016)	% of Total Jobs in Industry Group (2015)	Median Hourly Earnings	Typical Entry Level Education	Work Experience Required	Typical On-The-Job Training
Software Developers, Applications	1	1,808	21.1%	8.0%	$ 49.13	Bachelor's degree	None	None
Software Developers, Systems Software	1	1,073	19.4%	5.1%	$ 56.38	Bachelor's degree	None	None
Telecommunications Equipment Installers and Repairers, Except Line Installers	2	935	16.5%	5.1%	$ 27.26	Postsecondary non-degree award	None	Moderate-term on-the-job training
Computer User Support Specialists	1	886	19.5%	4.2%	$ 25.56	Some college, no degree	None	Moderate-term on-the-job training
Computer Systems Analysts	1	635	14.9%	3.8%	$ 43.71	Bachelor's degree	None	None
Telecommunications Line Installers and Repairers	2	495	25.0%	1.9%	$ 32.09	High school diploma or equivalent	None	Long-term on-the-job training
Computer Programmers	1	487	10.2%	4.2%	$ 41.95	Bachelor's degree	None	None
Computer and Information Systems Managers	1	381	13.5%	2.5%	$ 66.62	Bachelor's degree	5 years or more	None
Market Research Analysts and Marketing Specialists	1	334	20.1%	1.5%	$ 31.07	Bachelor's degree	None	None
Web Developers	1	243	21.2%	1.1%	$ 32.25	Associate's degree	None	None

Table 6: Defense, Transportation & Related Manufacturing Highest Growth Occupations from 2010-2016

Description	Tier	Change (2010 - 2016)	% Change (2010 - 2016)	% of Total Jobs in Industry Group (2015)	Median Hourly Earnings	Typical Entry Level Education	Work Experience Required	Typical On-The-Job Training
Aircraft Structure, Surfaces, Rigging, and Systems Assemblers	2	100	7.5%	1.8%	$ 23.15	High school diploma or equivalent	None	Moderate-term on-the-job training
Logisticians	1	50	5.6%	1.2%	$ 38.93	Bachelor's degree	None	None
Operations Research Analysts	1	8	3.2%	0.3%	$ 38.93	Bachelor's degree	None	None
Computer Numerically Controlled Machine Tool Programmers, Metal and Plastic	2	5	2.8%	0.2%	$ 28.07	High school diploma or equivalent	None	Long-term on-the-job training
Environmental Scientists and Specialists, Including Health	1	2	25.0%	0.0%	$ 39.48	Bachelor's degree	None	None
Airfield Operations Specialists	2	1	12.5%	0.0%	$ 28.80	High school diploma or equivalent	None	Long-term on-the-job training
Transportation Inspectors	2	1	2.3%	0.1%	$ 34.76	High school diploma or equivalent	None	Moderate-term on-the-job training
Construction Managers	1	1	3.4%	0.0%	$ 48.48	Bachelor's degree	None	Moderate-term on-the-job training
Firefighters	2	1	5.0%	0.0%	$ 38.07	Postsecondary non-degree award	None	Long-term on-the-job training
Rail Car Repairers	2	1	Insf. Data	0.0%	$ 20.47	High school diploma or equivalent	None	Long-term on-the-job training

Table 7: Biotech & Medical Devices Highest Growth Occupations from 2010 to 2016

Description	Tier	Change (2010 - 2016)	% Change (2010 - 2016)	% of Total Jobs in Industry Group (2015)	Median Hourly Earnings	Typical Entry Level Education	Work Experience Required	Typical On-The-Job Training
Team Assemblers	2	840	24.8%	6.9%	$ 12.14	High school diploma or equivalent	None	Moderate-term on-the-job training
Inspectors, Testers, Sorters, Samplers, and Weighers	2	386	17.1%	4.3%	$ 17.47	High school diploma or equivalent	None	Moderate-term on-the-job training
Biomedical Engineers	1	345	48.5%	1.7%	$ 46.55	Bachelor's degree	None	None
Machinists	2	208	26.8%	1.6%	$ 17.01	High school diploma or equivalent	None	Long-term on-the-job training
First-Line Supervisors of Production and Operating Workers	2	180	13.7%	2.5%	$ 25.02	Postsecondary non-degree award	Less than 5 years	None
General and Operations Managers	1	166	14.3%	2.2%	$ 51.75	Bachelor's degree	Less than 5 years	None
Sales Representatives, Wholesale and Manufacturing, Technical and Scientific Products	2	154	18.0%	1.7%	$ 35.29	Bachelor's degree	None	Moderate-term on-the-job training
Shipping, Receiving, and Traffic Clerks	2	139	14.9%	1.8%	$ 14.00	High school diploma or equivalent	None	Short-term on-the-job training
Industrial Engineers	1	126	12.5%	1.9%	$ 45.96	Bachelor's degree	None	None
Helpers--Production Workers	3	125	19.1%	1.3%	$ 11.03	Less than high school	None	Short-term on-the-job training

Chapter 4

Regional Employer Survey

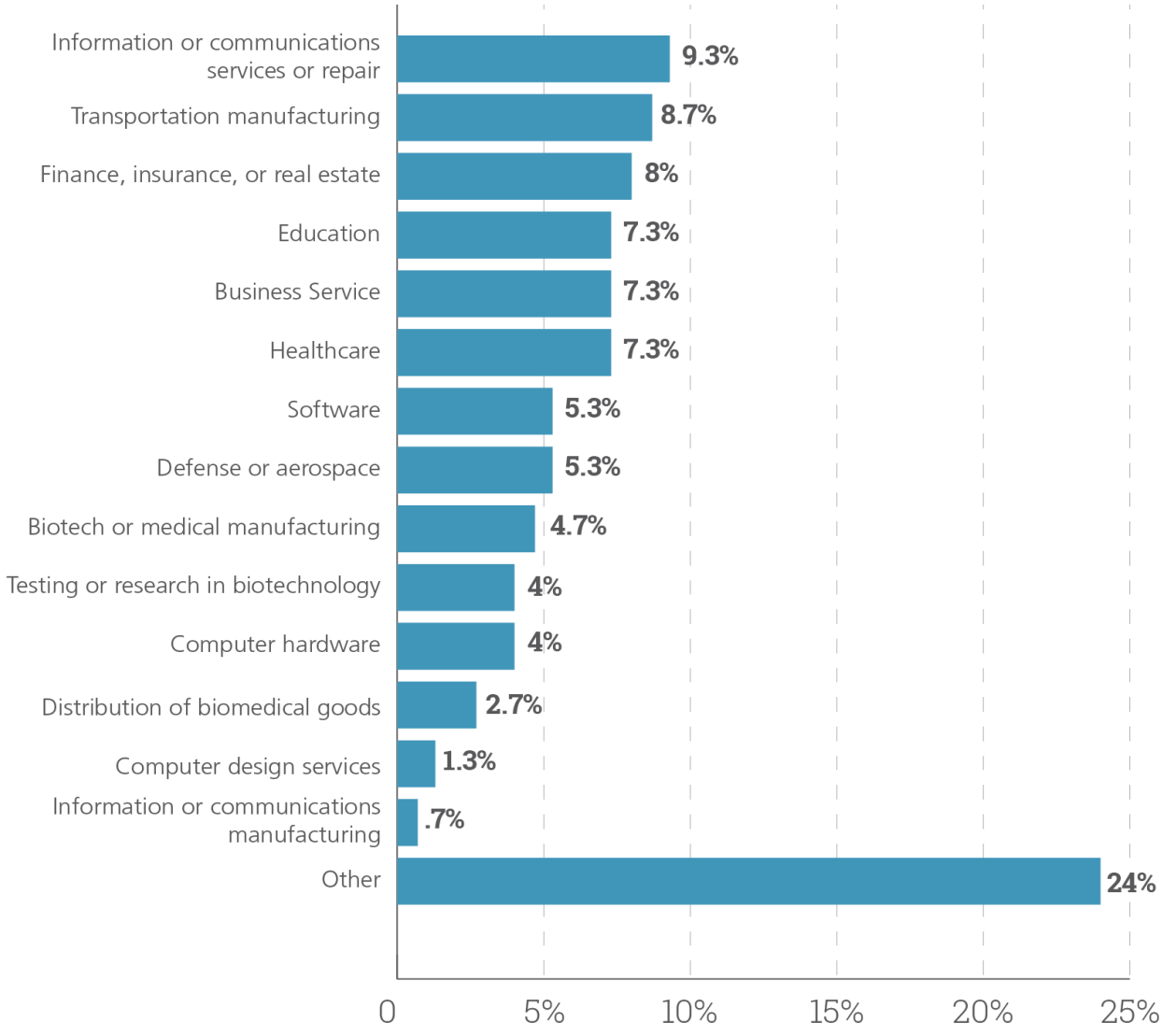
Of the seven major industry clusters identified in the previous chapter, six have experienced overall employment growth in the years since the beginning of the economic recovery (2010-2016). Ensuring that the regional workforce is able to meet the growing employment needs of these industry clusters is critical to their continued growth. A strong workforce enhances the region by increasing the productivity of existing firms and attracting new and innovative companies to the area. With this in mind, the City conducted a series of surveys to assess the hiring needs of employers, the challenges encountered by job seekers, and the skills gaps that may prevent the full integration of the regional workforce with growing industry clusters. This chapter presents the findings of a survey of regional employers representing a diverse sampling of industries to identify skills gaps and other workforce challenges impacting local and regional businesses.

EMPLOYER DEMOGRAPHICS

Guided by the industry cluster mapping process, the employer survey targeted specific industry segments in Los Angeles and Orange County. The following figure (Figure 1) displays the breakdown of responding businesses (n=150) by primary industry activity. The majority of segments below fit into larger industry clusters identified in the previous chapter such as Information and Communications Technologies (information or communications services or repair, software, computer hardware, computer design services, and information or communications manufacturing), Biotech and Medical Devices (biotech or medical manufacturing, testing, or research in biotechnology, and distribution of biomedical goods), and Defense, Transportation, and Related Manufacturing (transportation manufacturing and defense or aerospace).

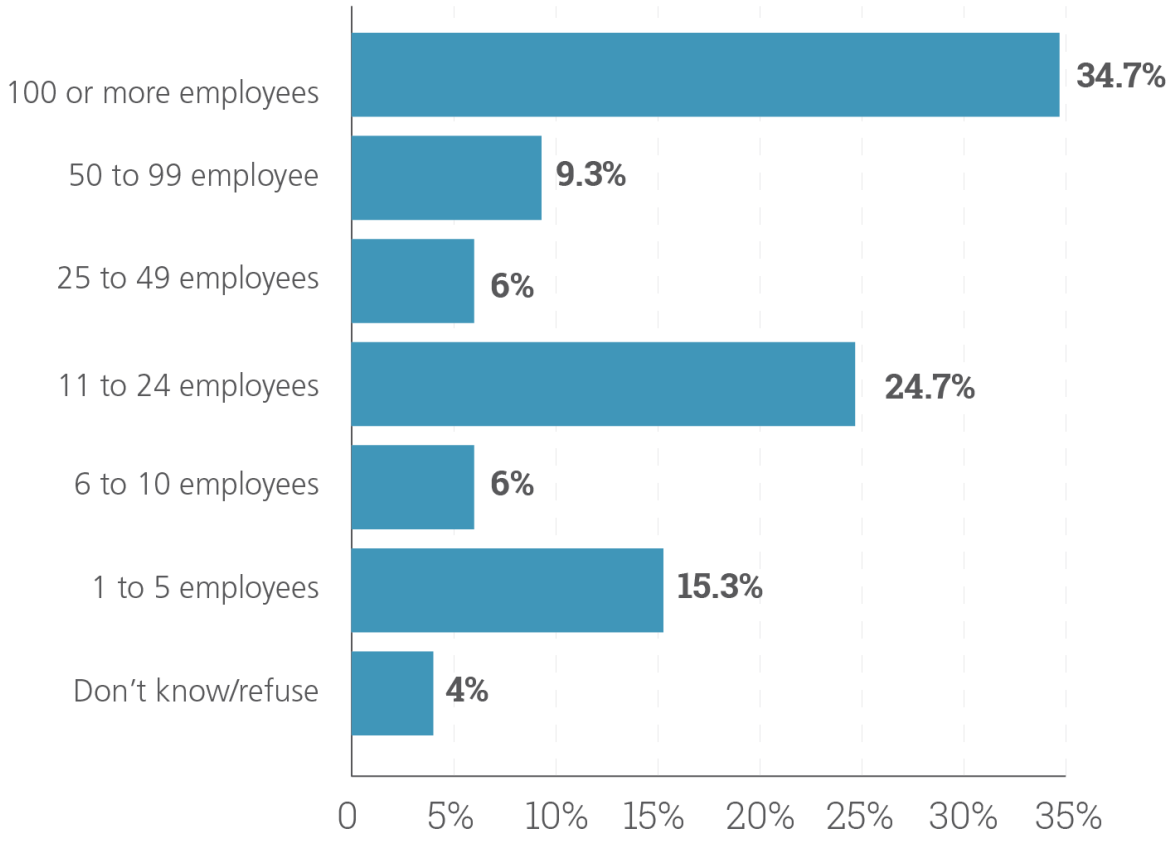
A large proportion of the remaining identified components in the chart below are themselves standalone industry clusters (finance, insurance, or real estate, education, business services, and healthcare). Approximately a quarter (24%) of employer survey participants did not fit into industry clusters identified for the region ("Other").

Figure 1: Employer Industry Segment



Over one-third of employers surveyed indicated that 100 or more employees worked at or from their current location in Los Angeles or Orange County. Approximately a quarter of respondents (24.7%) employ between 11 and 24 workers in the region. A small proportion of respondents (4%) either did not know the current employment at their location or refused to provide a count (Figure 2).

Figure 2: Employer Size



Sub-Group Analysis	Biotech and Medical Devices companies were most likely to indicate that they currently had 25 or more employees at their current location in Los Angeles or Orange County in comparison to all other firms (80% vs. 49%)

EMPLOYER GROWTH ESTIMATES

Employers in Los Angeles and Orange County were asked to estimate their growth in employment over the coming 12 months (Figure 3). More than one-third (34.7%) of responding companies expected to add workers, three-in-five (60%) projected the same level of employment, and less than five percent (4.7%) projected fewer employers 12 months from now. Less than one percent (0.7%) of survey-takers refused to provide a projection. Among the employers that provided current and projected employment estimates, overall growth was estimated to be 3% over the coming 12 months.

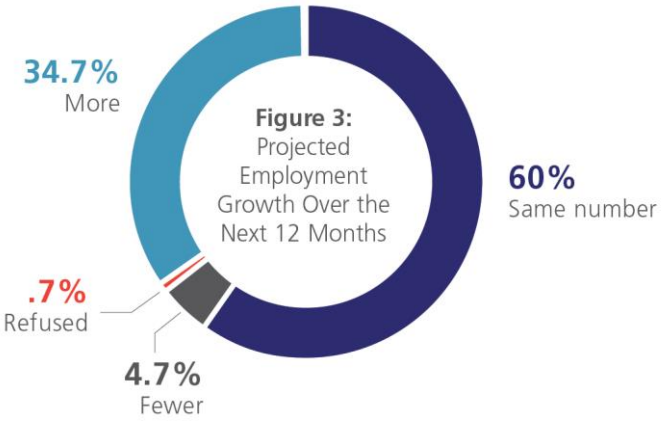


Figure 3: Projected Employment Growth Over the Next 12 Months

EMPLOYER TECHNOLOGY PROFILE

The majority of firms surveyed (56.7%) reported that they use both emerging and established technologies at their business location. Just under one-in-five (18.7%) indicated that they only used technology that was largely established and 15.3% said that they were focused on developing or supporting the development of new technology (Figure 4).

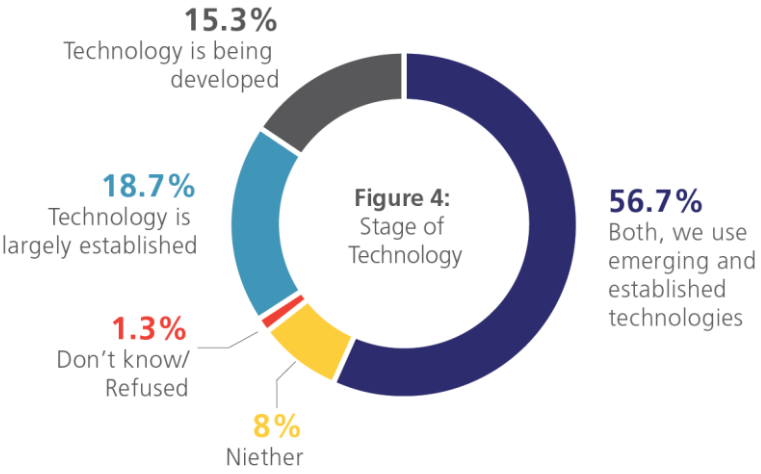
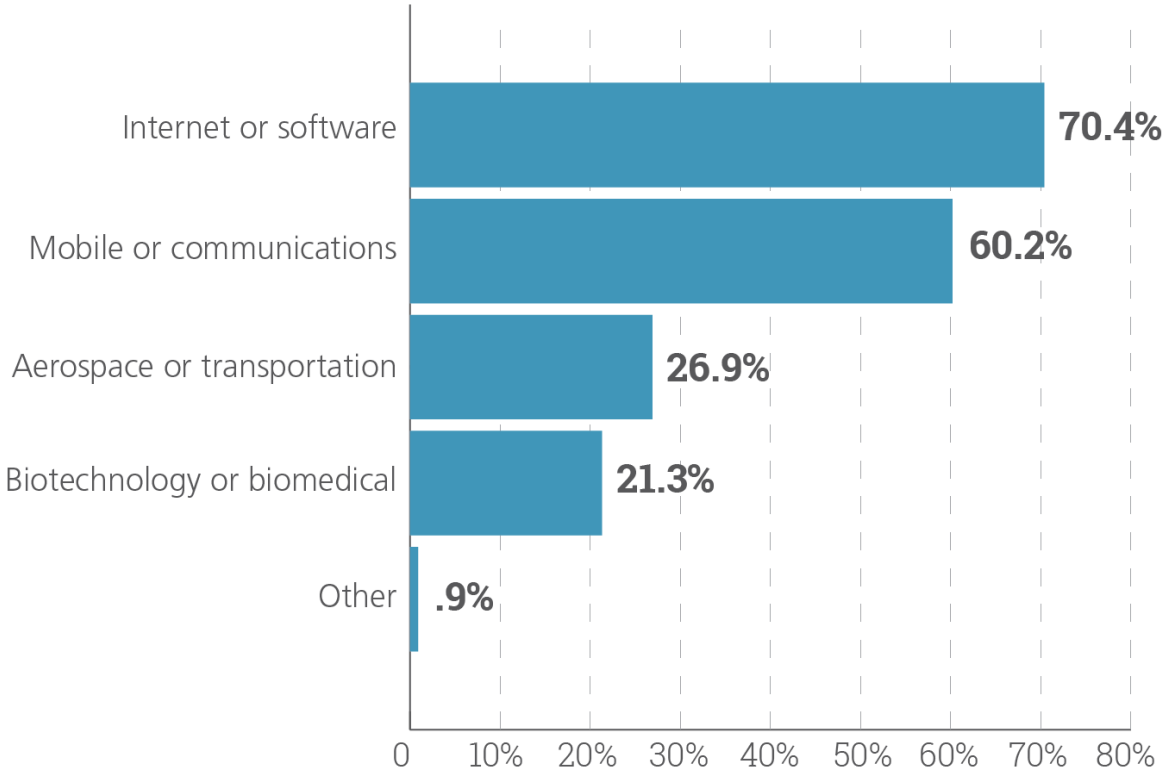


Figure 4: Stage of Technology

Sub-Group Analysis	Large businesses (25 or more employees) were more likely to indicate that they use both emerging and established technologies than small firms (1 to 9 employees) (66.7% vs. 34.6%).
	Firms that expect to grow over the next 12 months said that they were focused on developing or supporting the development of new technology (23.1%) at a higher rate than businesses that expect to maintain the same level of employment or lose employees (11.3%).

The majority of survey respondents identified Internet or software (70.4%) and mobile communications (60.2%) as the areas of technology that are most important to their firms (Figure 5). Additional technology areas that were mentioned by responding businesses included aerospace or transportation (26.9%), biotechnology or biomedical (21.3%), and "other" technologies (0.9%).

Figure 5: Important Technology Areas



GENERAL WORKFORCE PROFILE

ENTRY-LEVEL POSITIONS

Sixty-three percent (62.7%) of employer survey respondents reported difficulty finding qualified entry-level applicants for their location in Los Angeles or Orange County (7.3% "Great difficulty" or 55.3% "Some difficulty"). The remaining respondents indicated that they encountered "Little to no difficulty" (34.7%) or they didn't know or refused to answer (2.7%) (Figure 6).

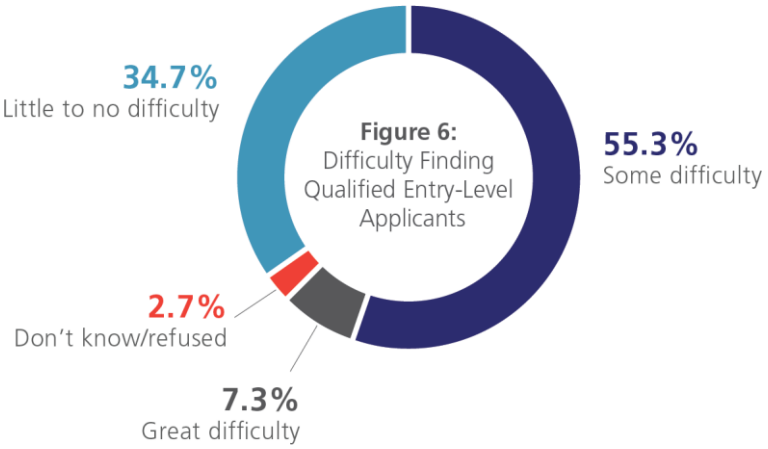
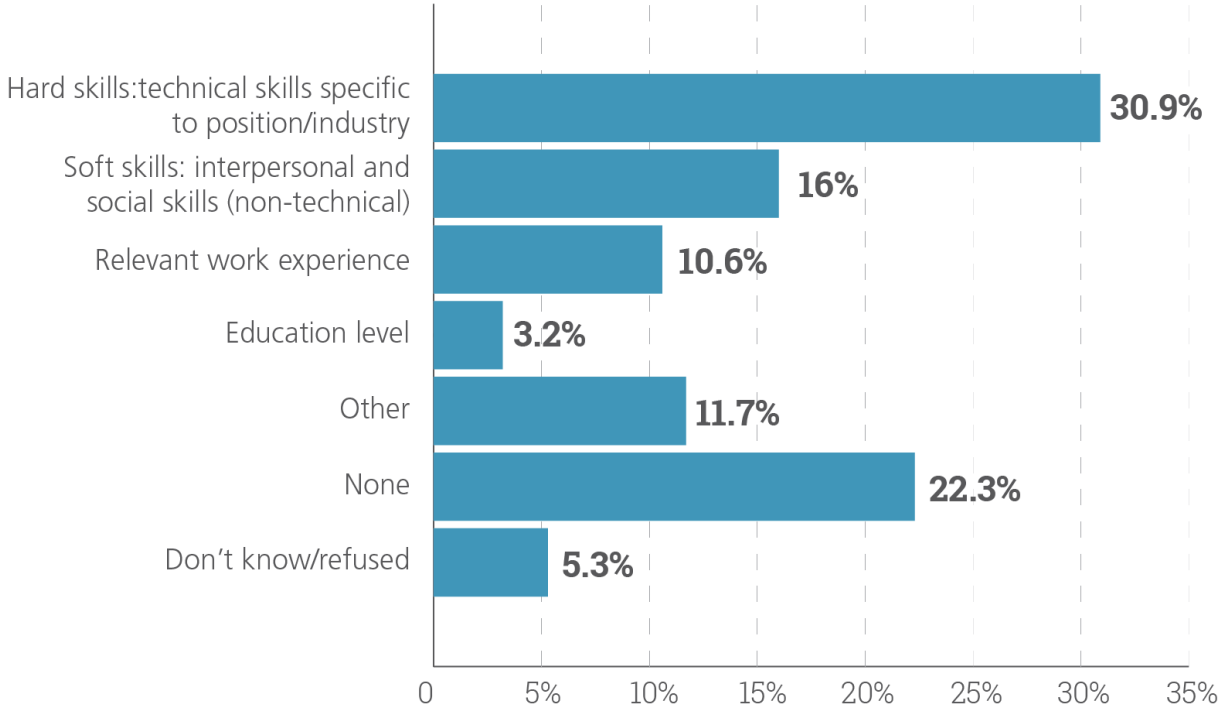


Figure 6: Difficulty Finding Qualified Entry-Level Applicants

Sub-Group Analysis	Large businesses (25 or more employees) were more likely to indicate that they experience "Little to no difficulty" finding qualified entry-level applicants for jobs at their firm than medium sized businesses (10 to 24 employees) (44% vs. 18.6%).

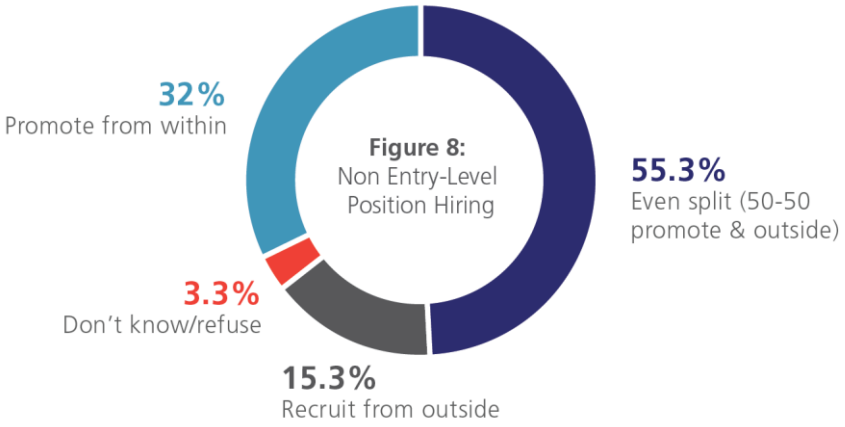
Hard skills (technical skills specific to the position and/or industry) were mentioned by the largest group of respondents (30.9%) that were able to identify specific skills or areas of expertise that are difficult to find among entry-level applicants for jobs at their organization.

Figure 7: Specific Skills or Areas of Expertise that are Difficult to Find Among Entry-Level Applicants

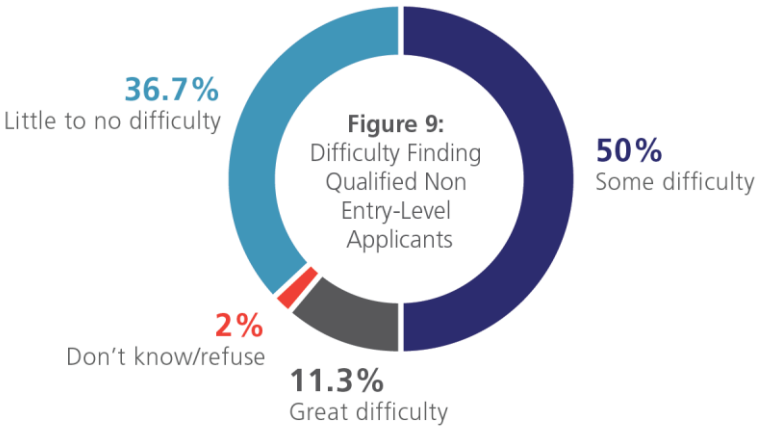


NON-ENTRY LEVEL POSITIONS

When a non-entry level position becomes available at businesses, nearly half of firms surveyed (49.3%) prefer to promote from within or recruit from outside at equal frequency. Nearly one-third primarily promote from within (32.1%), while 15.3% recruit non entry-level positions from outside the organization (Figure 8).



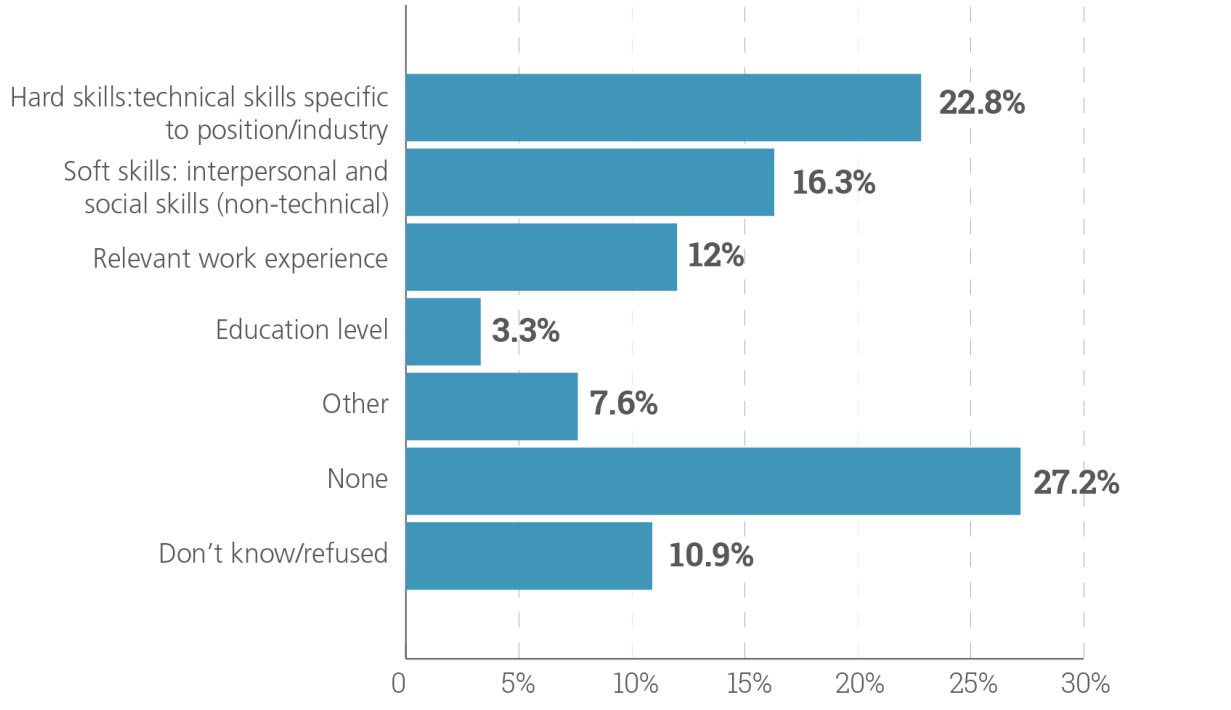
Sub-Group Analysis	Defense, Transportation, and Related Manufacturing firms indicated that they prefer to recruit employees for non-entry level positions from within and outside the company at an even split (76.2%) and at a much higher rate than Information and Communication Technologies businesses (48.4%), Biotech and Medical Devices firms (41.2%), and all other remaining companies (44.4%).
	Small firms (1 to 9 employees) were more likely to report that they recruit from outside when they have openings for non-entry level positions compared to large firms (25 or more employees) (30.8% vs. 8.0%).



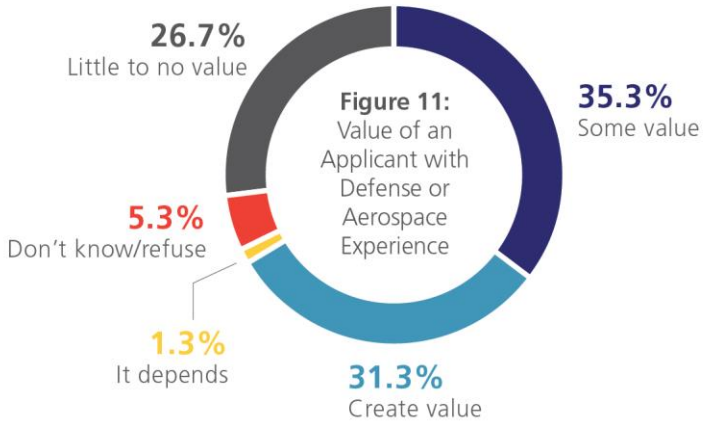
Just over three-in-five (61.3%) businesses surveyed reported that they had difficulty finding qualified non-entry level applicants for positions at their firm (11.3% "Great difficulty" or 50% "Some difficulty). More than one-third (36.7%) reported "Little to no difficulty" (Figure 9).

The following figure (Figure 10) displays the specific skills or areas of expertise that are difficult to fill among non-entry level candidates. The largest proportion of respondents that were able to name a skill or area of expertise mentioned hard skills (technical skills specific to the position and/or industry) (22.8%). More than ten percent of respondents also mentioned soft skills (interpersonal and social skills, non-technical) (16.3%) and relevant work experience (12%).

Figure 10: Specific Skills or Areas of Expertise that are Difficult to Find Among Non Entry-Level Applicants



VALUE OF EXPERIENCE IN DEFENSE OR AEROSPACE



Responding businesses were asked to share their perceived value of applicants with strong industry experience in the defense and aerospace arena, for the general occupations that they are applying for. Just over two-thirds of all respondents indicated that they would place value on an applicant with the described experience (31.3% "Great value" or 35.3% "Some value"). Over a quarter (26.7%) would place "Little to no value," 1.3% said that "It depends" and 5.3% didn't know or refused to answer.

CONCLUSION

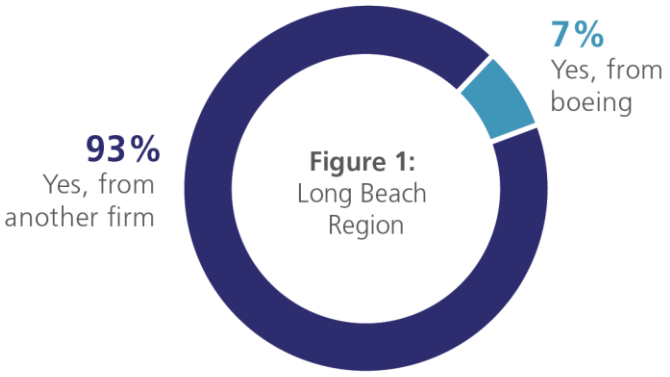
Over one-third of survey respondents anticipate employment growth within their company in the coming twelve months. This equates to a projected growth rate of approximately 3% across all respondents, which is equal to the estimated rate of employment growth across the industry clusters identified in Chapter 3. This data suggests that opportunities for job seekers are increasing in Long Beach and the surrounding region. However, responding employers report difficulty finding qualified applicants for entry level and non-entry level positions, citing hard and soft skills deficiencies among candidates as the most prevalent contributor to their hiring issues. The next chapter provides insight into these challenges from the opposite perspective by presenting the findings of a survey of dislocated workers in the region.

Chapter 5

Regional Dislocated Worker Survey

Dislocated workers in Long Beach and the surrounding area were contacted to assess their current employment status, work location, job satisfaction, and salary levels. For all dislocated workers, including those that had found employment and those that were still looking for their next opportunity, questions were asked to determine what strategies will guide their search for future job opportunities, what challenges and obstacles they have encountered as they seek employment, and what their needs are as job seekers. Finally, the survey requested a self-assessment of the respondents' readiness for future employment opportunities, including an assessment of their skills and abilities. Taken with the Regional Employer Survey results presented in Chapter 4, this information provides an understanding of how individuals are faring in the labor market and how they City may best respond to ensure that the workforce is equipped to meet the employment needs of growing industry clusters.

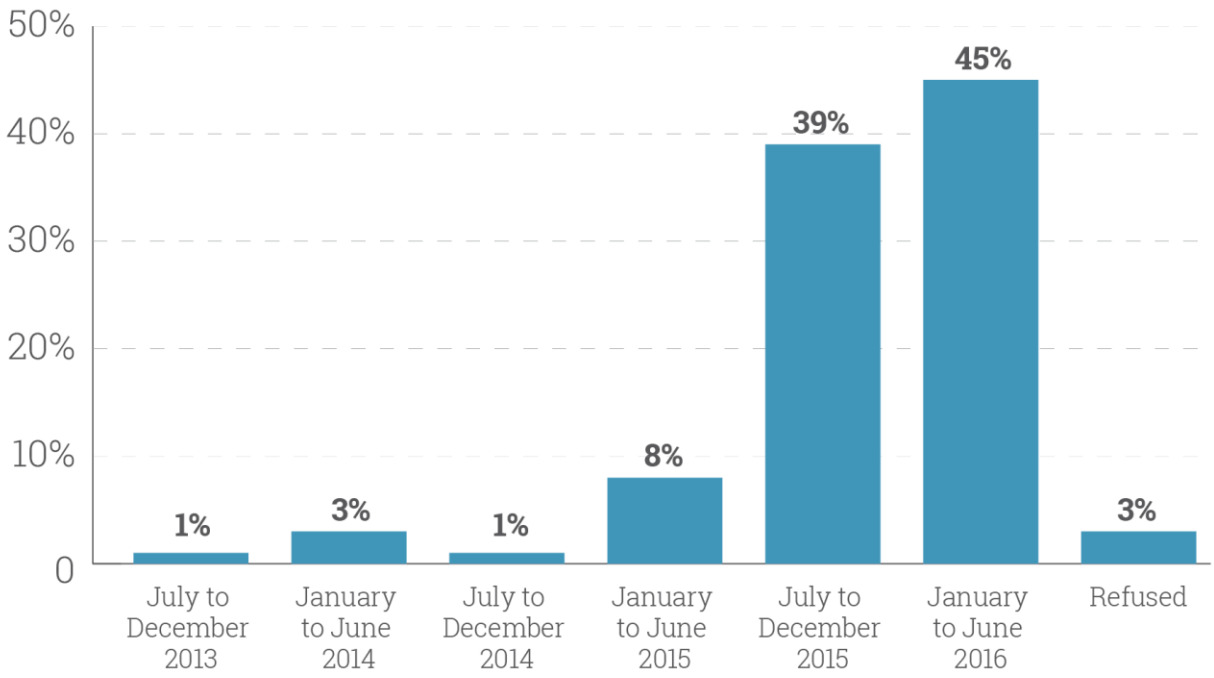
DISLOCATED WORKER SURVEY RESULTS



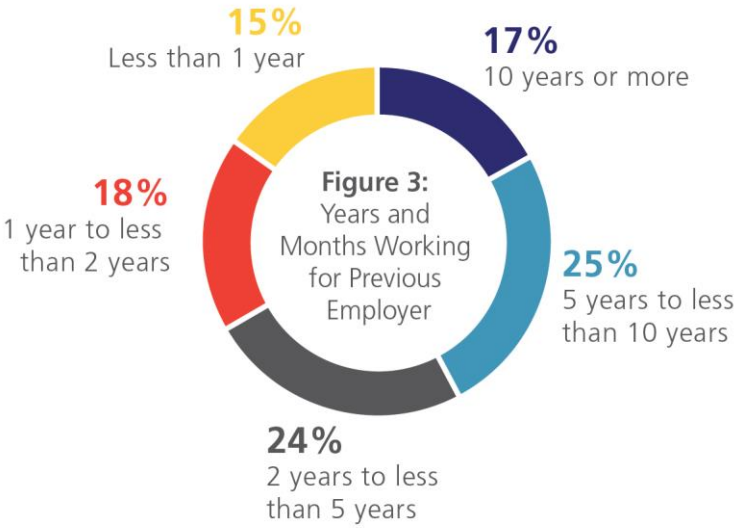
Initially, respondents (n=100) were asked to indicate whether they were laid-off from Boeing or another firm in and around Long Beach. Approximately seven percent of dislocated workers surveyed had worked at Boeing, while the majority indicated they had worked at another firm (Figure 1).

Each of the respondents had been laid-off from a job in the previous three years (except for a minority of individuals that refused to answer the question – 2%). Most dislocated workers that responded to the survey had been laid-off since July 2015 (85% - 39% between July and December 2015 and 45% between January and June 2016) (Figure 2).

Figure 2: Month and Year of Lay Off



The survey respondents had been employed for various lengths of time at their employer before being laid-off. Just over two-in-five dislocated workers were employed for five years or more (42%) before being laid-off. The following figure illustrates the distribution of tenure at previous employers.

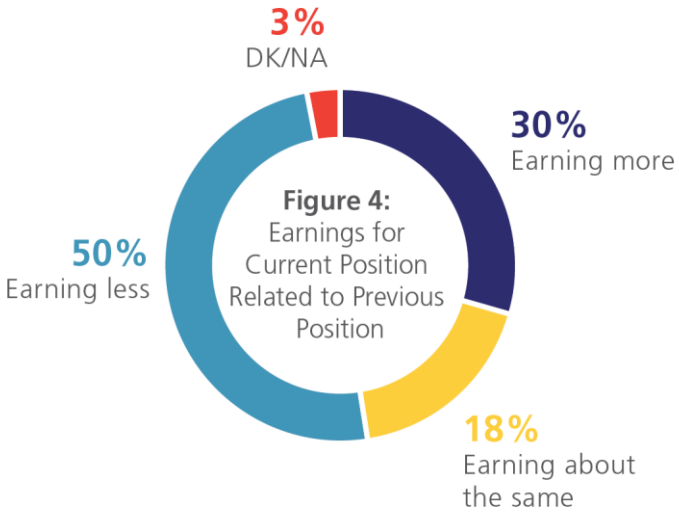


Survey participants were asked to provide their job title to determine what their role had been at their previous companies. Among dislocated workers that responded to the survey, nearly half (46%) of were employed within a management occupation (18%), an office and administrative support occupation (16%), or a sales and related occupation when they were laid-off from their previous organization. Approximately six percent held down an installation, maintenance, and repair related job title.

EMPLOYMENT PROFILE

CURRENT CONDITIONS

Among the dislocated workers that participated in the survey, more than half (53%) were not currently working and looking for work. On top of that, more than one-in-five (22%) were currently working full-time or part-time while pursuing other work opportunities. Of those that were currently employed, one-fifth (20%) were working in healthcare or education, one-tenth (10%) were employed at a professional, scientific, and technical services (including consulting) firm, 10% were involved with manufacturing, and eight percent worked within the aerospace and/or related defense industry.[16]



EARNINGS FOR EMPLOYED INDIVIDUALS

Half of all respondents (50%) that were able to secure employment after being laid-off from an employer in the Long Beach region over the previous three years were earning less at their current job when compare to their previous situation. Nearly one-in-five were earning about the same amount and 30% were earning more at their current job.

WORK LOCATION FOR EMPLOYED INDIVIDUALS

More than a third of employed survey respondents work in Long Beach (35%), 13% work in coastal northern Orange County (Seal Beach, Los Alamitos, Westminster, Fountain Valley, or Huntington Beach), one-in-ten work in the South Bay other than Long

[16] The remaining industries include; food and accommodation services (8%), retail (8%), business support services (includes employment and management services) (5%), and other industries (33% - no single category included more than one response)

Beach (Carson, Torrance, Gardena, Redondo, Hermosa, or Manhattan Beaches), 10% are employed in the City of Los Angeles (10%), and approximately a third (33%) work in other regions.[17]

Figure 5: City or Community of Current Employment

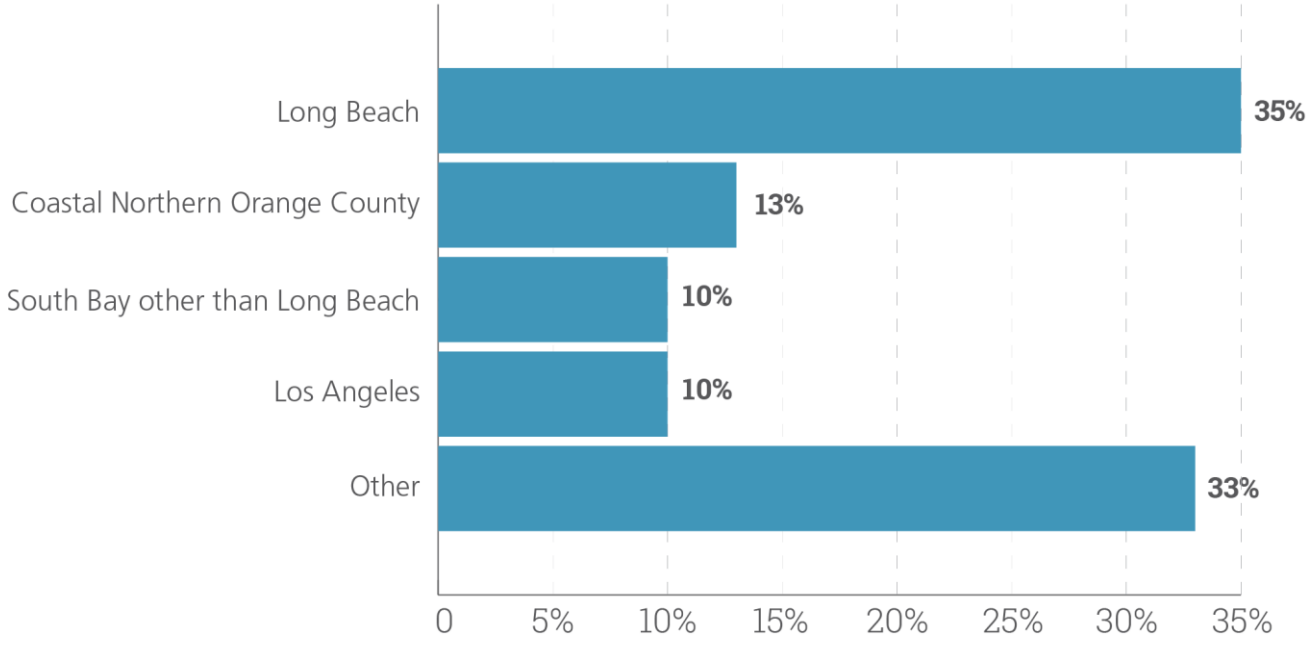
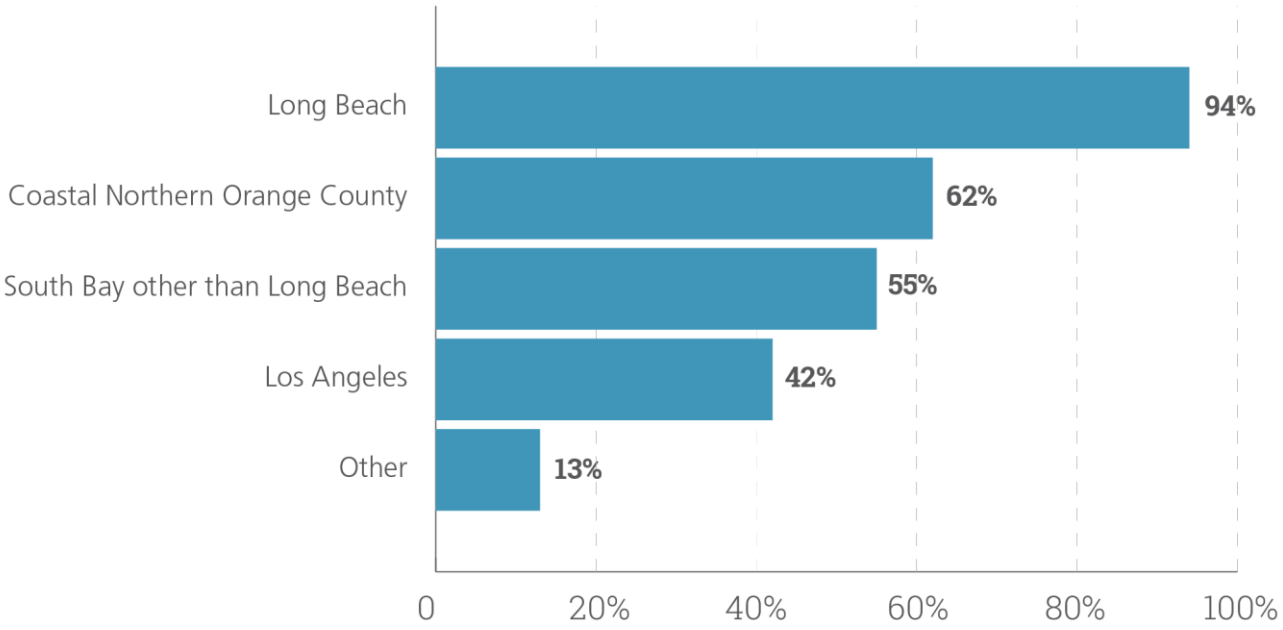


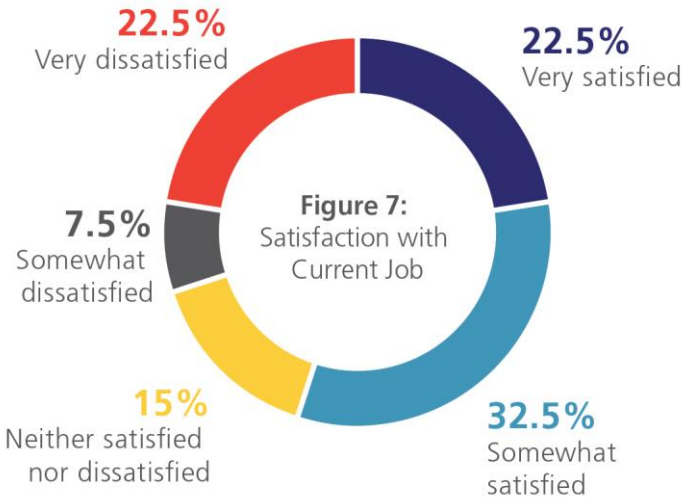
Figure 6 below highlights the locations that currently employed individuals who would like another job are looking for work. The largest percentage (94%) are currently looking for work in the City of Long Beach.

Figure 6: City or Community Preferred for Job by Those Employed and Looking for Work[18]



[17] No single category within the "other" responses garnered more than one response
[18] Multiple responses were permitted, percentages sum to more than 100%

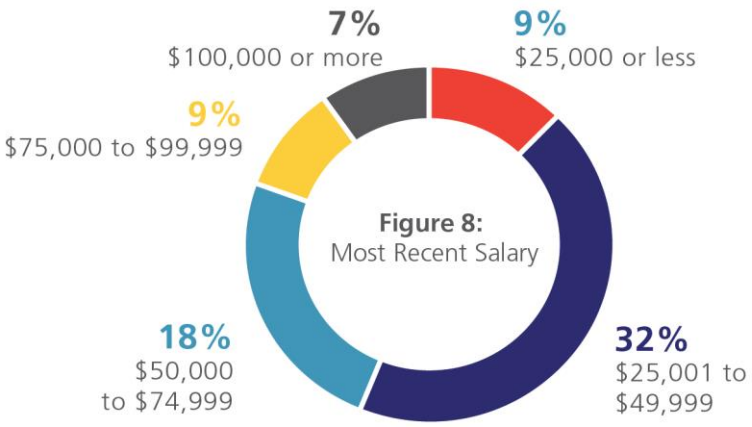
SATISFACTION WITH CURRENT EMPLOYMENT



Satisfaction for previously laid-off employees varies. Of those that found employment after being laid-off, more than half were satisfied (approximately 55% - 23% "Very satisfied" and 33% "Somewhat satisfied"), while nearly a third were dissatisfied (31% - 23% "Very dissatisfied" and 8% "Somewhat dissatisfied") with their current job. Approximately 15% indicated that they were neither satisfied nor dissatisfied with their current situation (Figure 7).

MOST RECENT SALARY

Both currently employed and unemployed individuals were asked to provide their most recent salary (current or previous job). Nearly a third (32%) of survey respondents reported that they made between $25,001 and $49,999 at their current or previous job. Just under a fifth (18%) indicated a salary range of $50,000 to $74,999, while 13% made $75,000 or more. Nine percent of survey respondents brought in $25,000 or less at their current or previous job.



FUTURE EMPLOYMENT OPPORTUNITIES

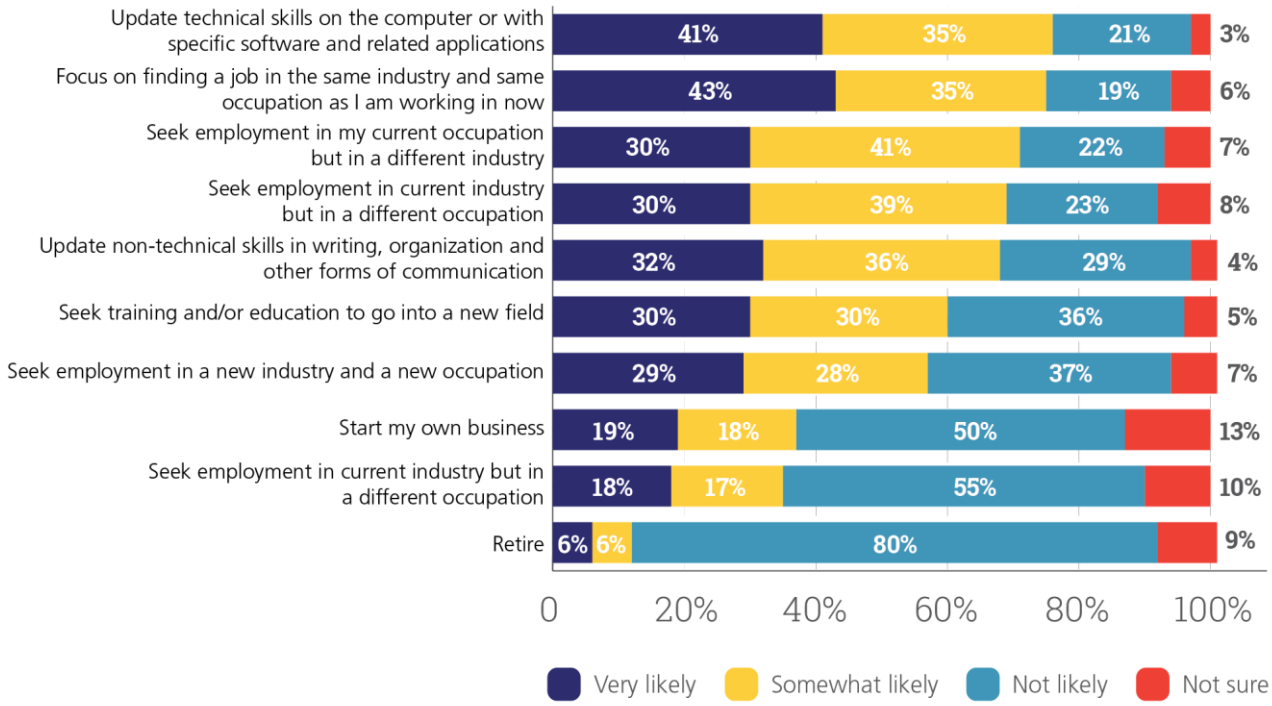
All survey respondents were asked a series of questions to assess their preparation, attitude, perceived challenges, and opinions regarding their current skills and abilities within the context of the labor market.

STRATEGIES FOR FUTURE EMPLOYMENT

More than two-thirds of respondents indicated that it was likely ("Very likely" or "Somewhat likely") that they would "Update technical skills on the computer or with specific software and related occupations" (76%), "Focus on finding a job in the same industry and same occupation as the one they are working in now" (75%), "Seek employment in their current occupation but in a different industry" (71%), "Seek employment in current industry but in a different occupation" (69%), and "Update non-technical skills in writing, organization and other forms of communication" (67%).

At least half of respondents reported that it is “Not likely” that they will “Retire” (80%), “Seek employment in current industry but in a different occupation” (55%), or “Start their own business” (50%).

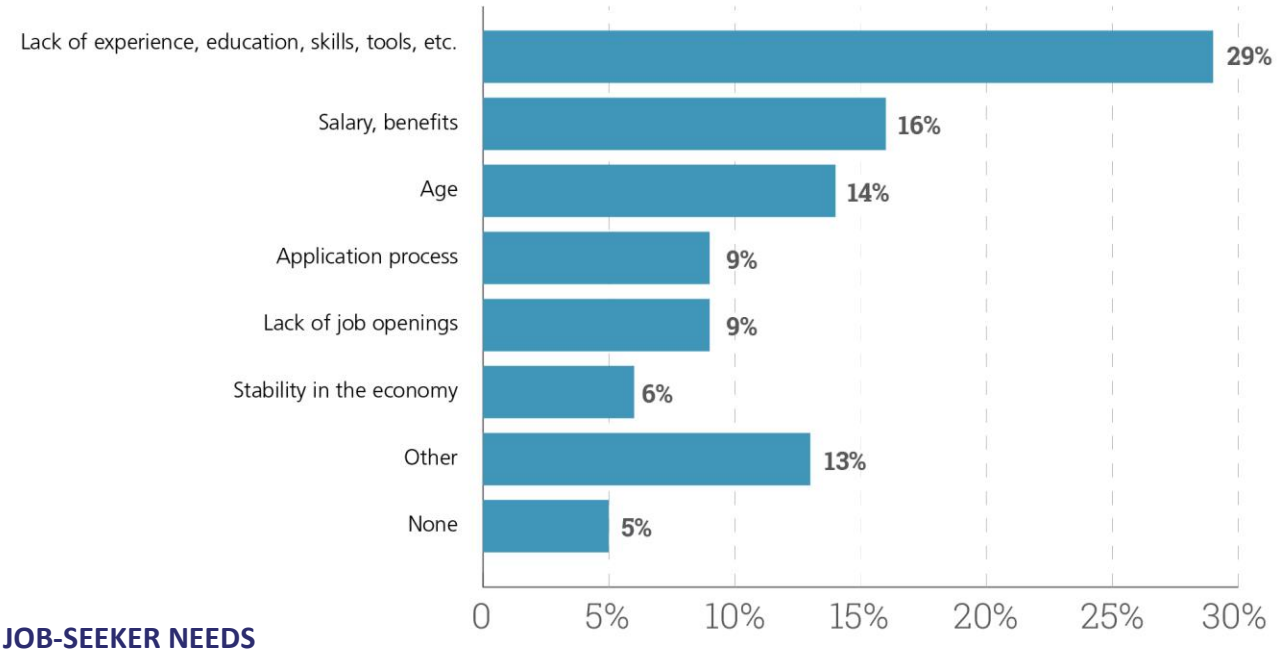
Figure 9: Likelihood of Employing Strategies for Future Employment Opportunities



CHALLENGES OR OBSTACLES FOR FINDING PREFERRED JOB

More than one-in ten respondents reported that lack of experience, skills, tools, etc. (29%), salary and/or benefits (16%), or age (14%) were perceived challenges or obstacles for finding the type of job that they currently want or desire in the future. Five percent of respondents said that no challenge or obstacle stood in the way for achieving the same goal. These responses are represented in Figure 10 below.

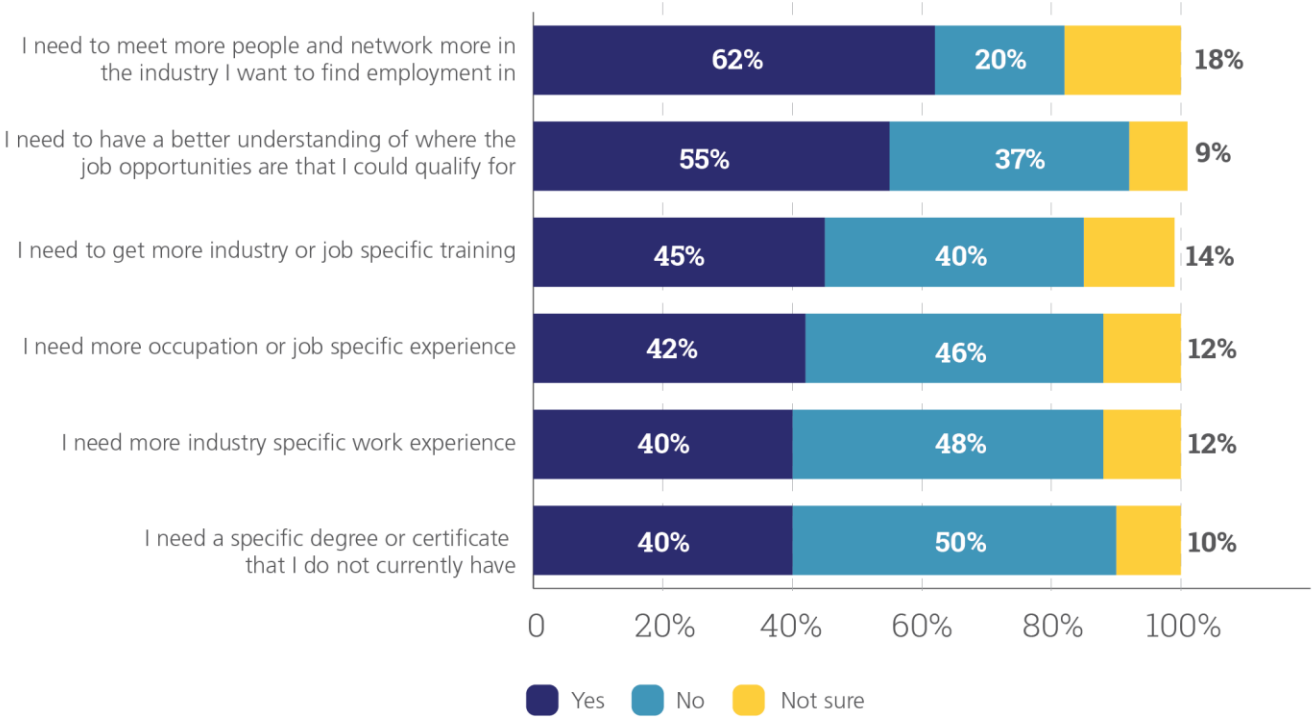
Figure 10: Biggest Challenge or Obstacle for Preferred Job



JOB-SEEKER NEEDS

More than half of workers that had been laid-off in the Long Beach region in the last three years feel that they "need to meet more people and network more in the industry they want to find employment in (62%) and "need to have a better understanding of where the job opportunities are that they qualify for" (55%).

Figure 11: Relevance of Common Job-Seeker Needs



As a follow-up, respondents were asked to identify the most important or most relevant need from the common job-seeker needs that they identified[19] as relevant to themselves. The largest percentage of survey respondents said that the need for a specific degree or certificate that they do not currently have is the most important for future employment. The following lists job-seeker needs in order of importance;

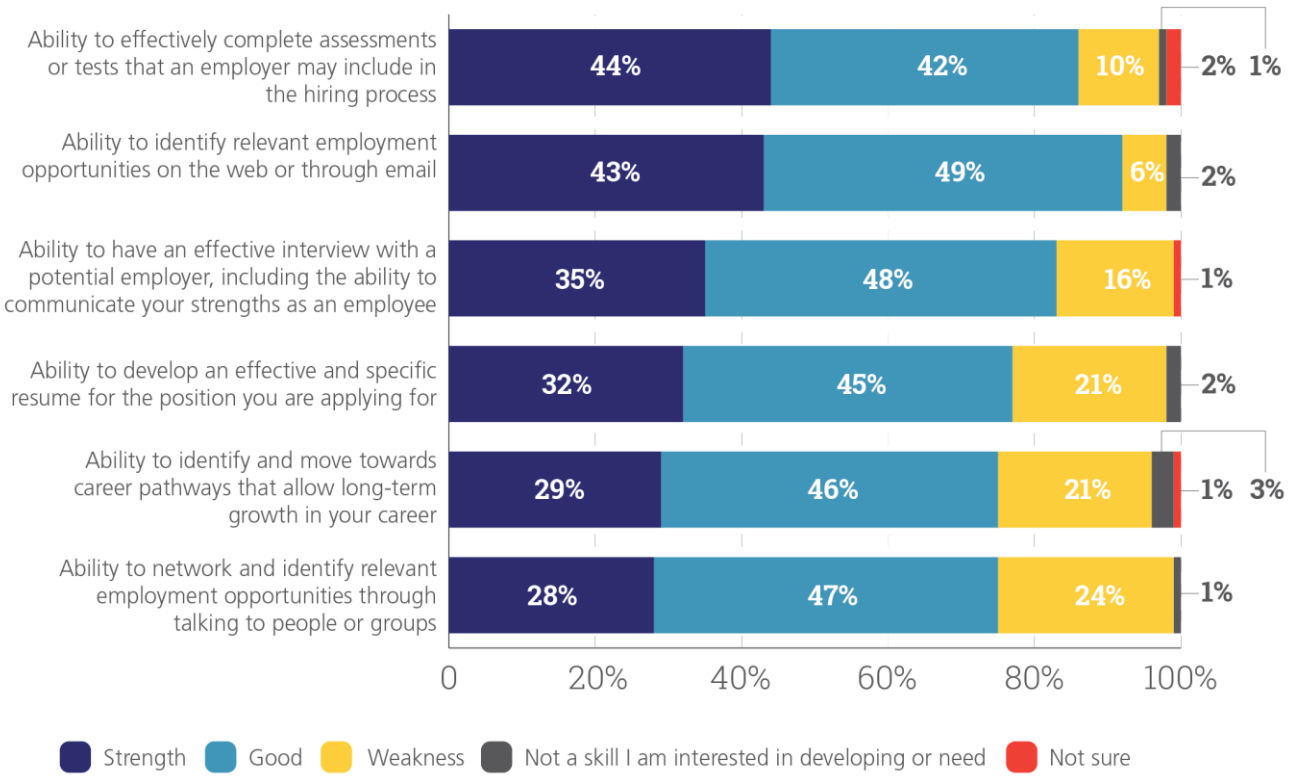
- I need a specific degree or certificate that I do not currently have – 27%
- I need to meet more people and network more in the industry I want to find employment in – 22%
- I need to have a better understanding of where the job opportunities are that I could qualify for – 20%
- I need to get more industry or job specific training – 12%
- I need more industry specific work experience – 11%
- I need more occupation or job specific experience – 9%

SELF-ASSESSMENT

Survey respondents were tasked with assessing their current skills and abilities as it relates to finding future employment. More than a third of survey-takers felt that their "Ability to effectively complete assessments or tests that an employer may include in the hiring process" (44%), their "Ability to identify relevant employment opportunities on the web or through email" (43%), and their "Ability to have an effective interview with a potential employer, including the ability to communicate your strengths as an employee" (35%) was a strength (does not need to be improved at this time).

Nearly a quarter of respondents to the dislocated worker survey reported their "Ability to network and identify relevant employment opportunities through talking to people or groups" (24%) as a weakness.

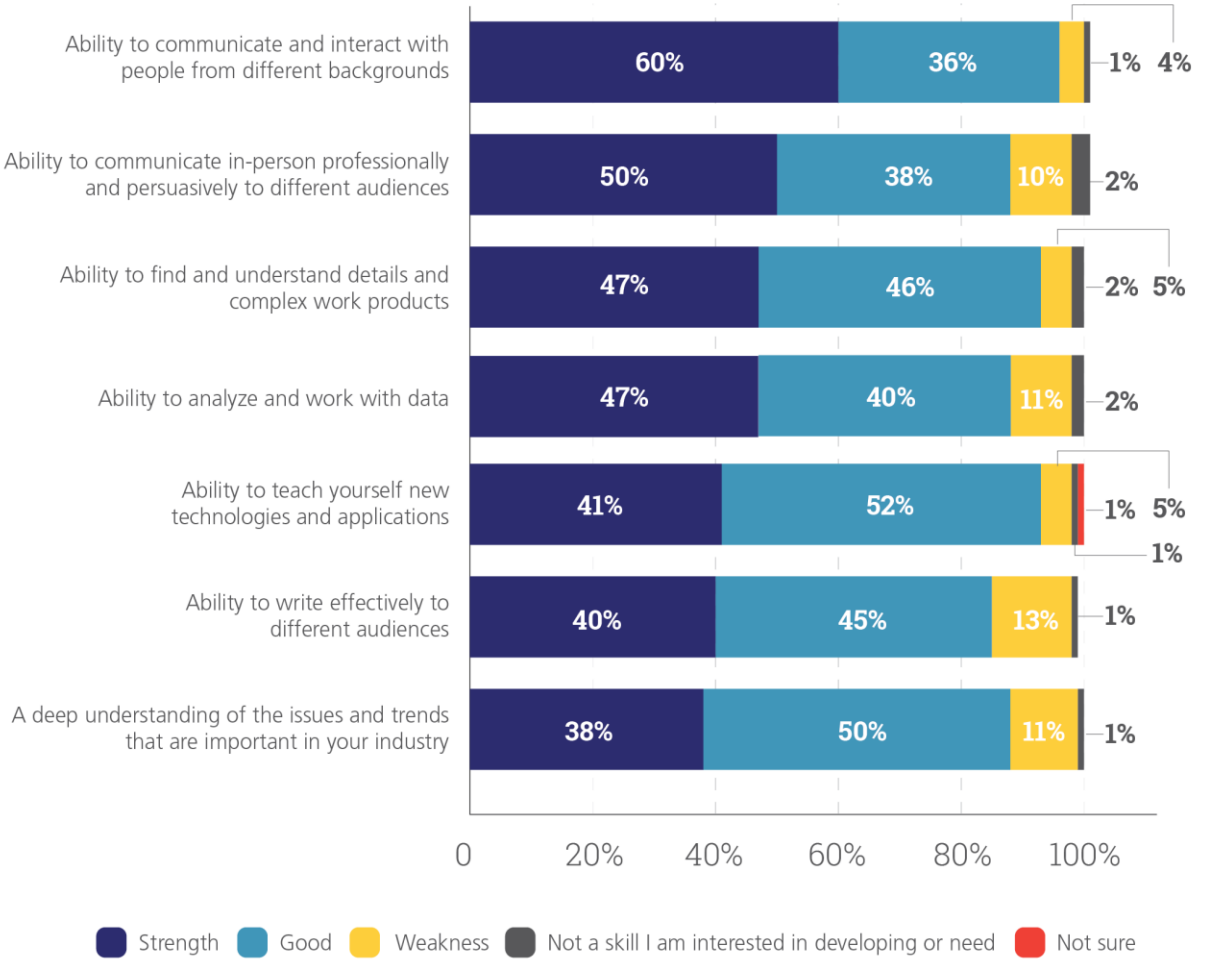
Figure 12: Self-Assessment of Skills and Abilities Related to Finding a Job



[19] Said "yes" to

Similarly, respondents were asked to provide an assessment of various areas related to the employment opportunities that they are seeking. At least half of survey-takers indicated that their "Ability to communicate and interact with people from different backgrounds" (60%) and their "Ability to communicate in-person professionally and persuasively to different audiences" (50%) were strengths.

Figure 13: Self-Assessment of Skills and Abilities Related to Employment Opportunities



Workers that had been laid-off from a firm in the Long Beach region over the previous three years are generally confident in their ability to find employment in the future. More than four-in-five respondents agreed (83%) that they are confident in their ability to find and get employed in a position that I will be satisfied with (38% "Strongly agree" and 44% "Somewhat agree") (Figure 14).

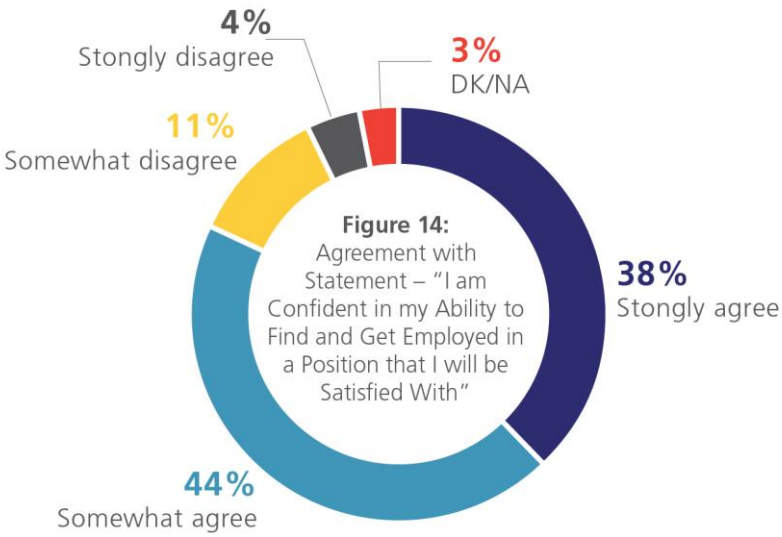


Figure 14: Agreement with Statement – "I am Confident in my Ability to Find and Get Employed in a Position that I will be Satisfied With"

Section III –

Land Use and Infrastructure Planning

Chapter 6

Summary of Existing Conditions Report

The City contracted Dudek, an environmental and engineering consulting firm, to prepare an Existing Conditions Report for the Boeing C-17 Transition Master Plan in order to provide a detailed analysis of the existing setting of the C-17 site and surrounding study area. The report describes the regional, local, and policy context for the project, and describes the existing conditions related to land use, circulation and mobility, and infrastructure. This chapter describes the study area and provides a summary of the key opportunities and constraints observed from the analysis that have led to the development of land use alternatives for the C-17 site. For more detailed information, please see the full Existing Conditions Report online at www.pacific-gateway.org/c-17.

STUDY AREA

The Boeing C-17 study area is located in the City of Long Beach adjacent to the City-owned Long Beach Airport, one of the busiest general aviation airports in the world and a hub of corporate activity. The study area is afforded direct access from the Interstate 405 (I-405) freeway via Cherry Avenue, providing easy access and high visibility to the study area from a regional standpoint.

The total study area is approximately 210 acres and includes the following three sub-areas as shown in Figure 1: 1) the former Boeing C-17 Site, which consists of multiple parcels totaling 93 acres primarily owned by Boeing; 2) adjacent property owned by the City for airport and former C-17 related purposes comprising 57 acres (Airport Adjacent Site); and 3) properties on the east and west side of Cherry Avenue adjacent to the C-17 Site (Cherry Avenue Corridor), comprising approximately 60 acres.

Top to Bottom: C-17 manufacturing building (top); buildings within Airport Adjacent Area (middle); commercial strip along Cherry Avenue (bottom)

The study area is primarily composed of industrial land uses, occupying approximately 95% of the total study area. The C-17 site is developed with approximately 1.1 million square feet (approximately 25 acres) of enclosed C-17 production space, an adjacent building to the north about half that size, a paint hangar, and associated buildings and grounds, as shown in Figure 1. The Airport Adjacent Site is developed with occupied trailers, executive offices, the AirFlite airport terminal, and Fire Department Station 16. The Cherry Avenue Corridor is developed largely with industrial uses, with commercial land uses occupying the remaining 5% of the total study area and concentrated at the corner of Cherry Avenue and Wardlow Road.

In contrast to the nearby residential neighborhood of California Heights to the northwest, as well as the Douglas Park business center to the northeast, the study area is characterized by extensive block lengths and minimal on-street landscaping and amenities, contributing to a heavily auto-oriented environment. The presence of industrial and manufacturing buildings near sensitive land uses such as homes, schools and parks, also have health-related consequences as they expose people to environmental hazards. Nevertheless, the location of the study area near the Long Beach Airport create compatibility issues that limit the types of land uses that are appropriate for the study area, and is well suited for industrial, manufacturing and other business-related uses.

OPPORTUNITIES AND CONSTRAINTS

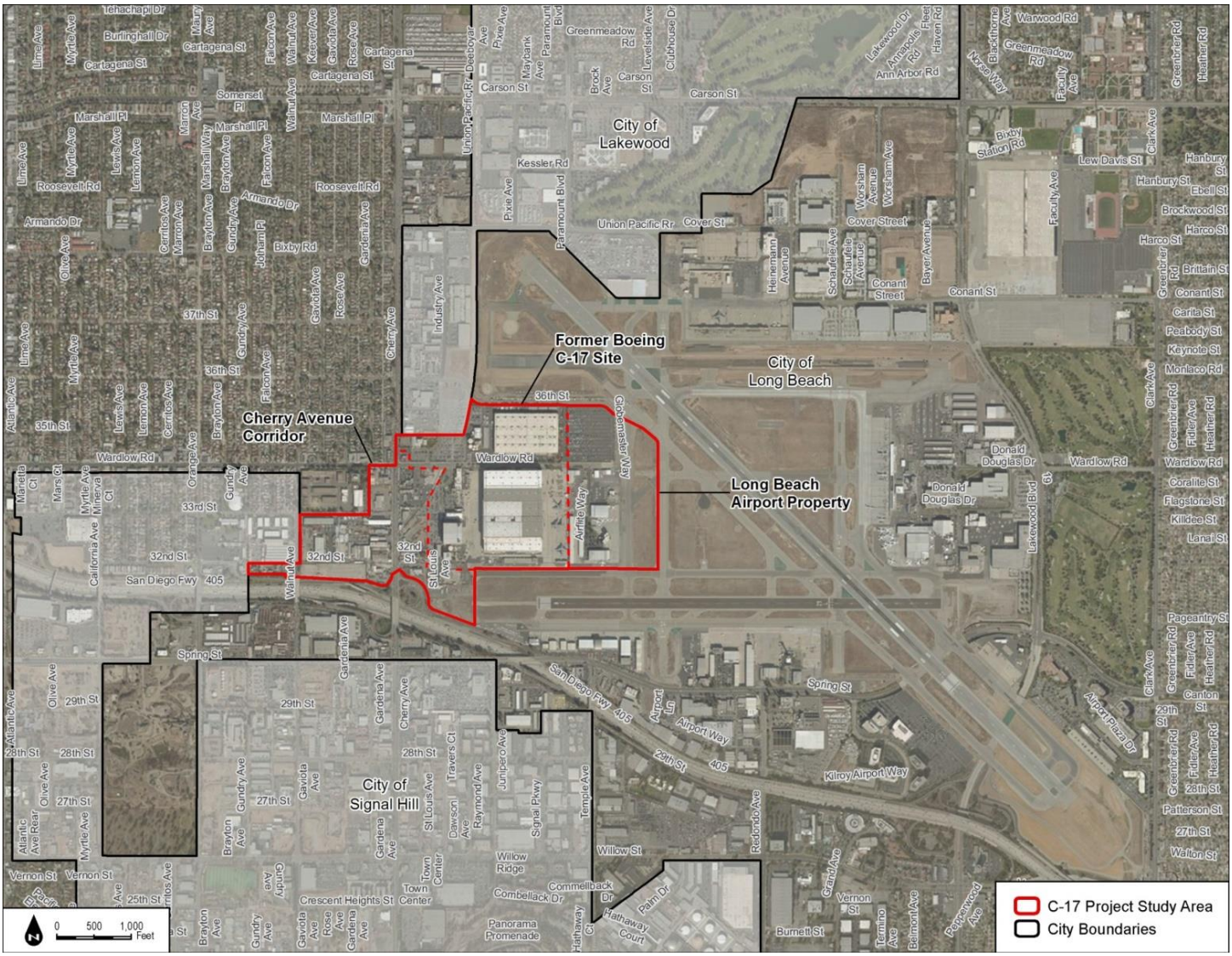
The Existing Conditions Report analysis led to a series of observations that helped determine opportunities and constraints for the study area. Many of these conclusions helped guide the development of potential land use alternatives for the C-17 site, including the following considerations:

- Large, vacated industrial space previously occupied for the manufacturing of the C-17 planes provide opportunities for reuse. However, retaining the buildings could also pose challenges for businesses that may demand smaller space configurations. Having the flexibility to determine the outcome of the buildings based on the needs of the end user was an important conclusion of the report.
- The installation of connectivity improvements and a master streetscape plan would help encourage other modes of transportation, improve traffic flow, enhance environmental quality, and potentially drive new investment to this area.

Top to Bottom: Example of large industrial block in study area lacking on-street landscaping (top); Example of large industrial block in study area with exemplary streetscape. (bottom)

- Given the study area's proximity to Long Beach Airport, noise-sensitive uses (e.g., residential uses, nursing homes, outdoor amphitheaters) would not be appropriate uses.
- Given the proximity to Long Beach Airport, portions of the site as identified in the Existing Conditions Report are affected by high noise levels and other safety constraints associated with adjacent aircraft activity, rendering portions of the site inappropriate for new structures and/or requiring limits on people per acre.
- Including recreational amenities into the study area may benefit the workforce and the overall walkability of the area.
- Roadway conditions will need to be assessed for their adequacy to accommodate future growth and development, including their ability to accommodate a wide range of vehicles. Any needed upgrades to bring the condition of roads up to standard should be identified.
- Water and Wastewater Master Plans are needed to better assess the current infrastructure and specifically identify existing "choke points" and potential future land use constraints.
- Coordination with SCE will be required to evaluate future land use scenarios in regards to energy demand as all of the substations servicing the area appear to be at or near capacity.

Figure 1. Study Area



Chapter 7

Public Opinion Survey

This region is home to approximately 607,600 total residents, representing broad socioeconomic and demographic diversity.[20] In order to ensure that their opinions were incorporated into the Plan, residents in Long Beach, Lakewood, Seal Beach, Los Alamitos, Signal Hill, and Rossmoor were surveyed to assess their quality of life and identify perceived issues in the community. Additionally, the survey ascertained respondents' awareness of the C-17 Boeing facility closure and asked their opinion of potential uses for the facility and land. In this regard, the survey was an opportunity for the City to collect public input on the future of the C-17 site beyond those ideas advocated by community members at the charrettes.

[20] Source: American Community Survey (ACS) 2010-2014 5-year estimates

RESIDENT SURVEY RESULTS

QUALITY OF LIFE IMPROVEMENTS

To begin the survey, residents in the Long Beach region (Figure 1) were asked to indicate the most important thing that should be done to improve the quality of life in the area. More than one-in-five residents (21%) mentioned the reduction of crime or an increase in community safety are most important for the improvement of the quality of life. More than one-in-ten residents surveyed responded that cleaning up the beaches, parks, sidewalks, etc. (19%) and improving the quality of the roads and other infrastructure (12%) were the most important. Only two percent of individuals said that nothing needs improvement while four percent either did not know or did not offer an opinion (Figure 2).

Figure 1: Long Beach Region

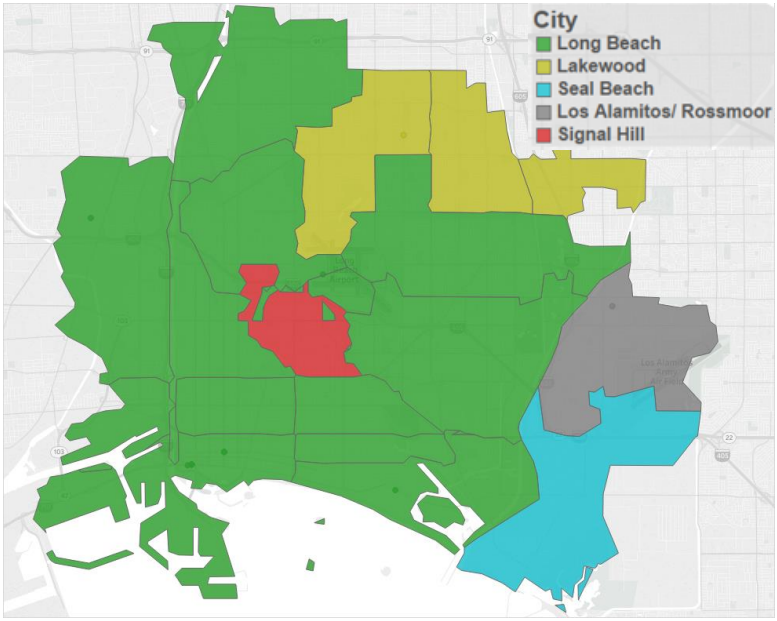
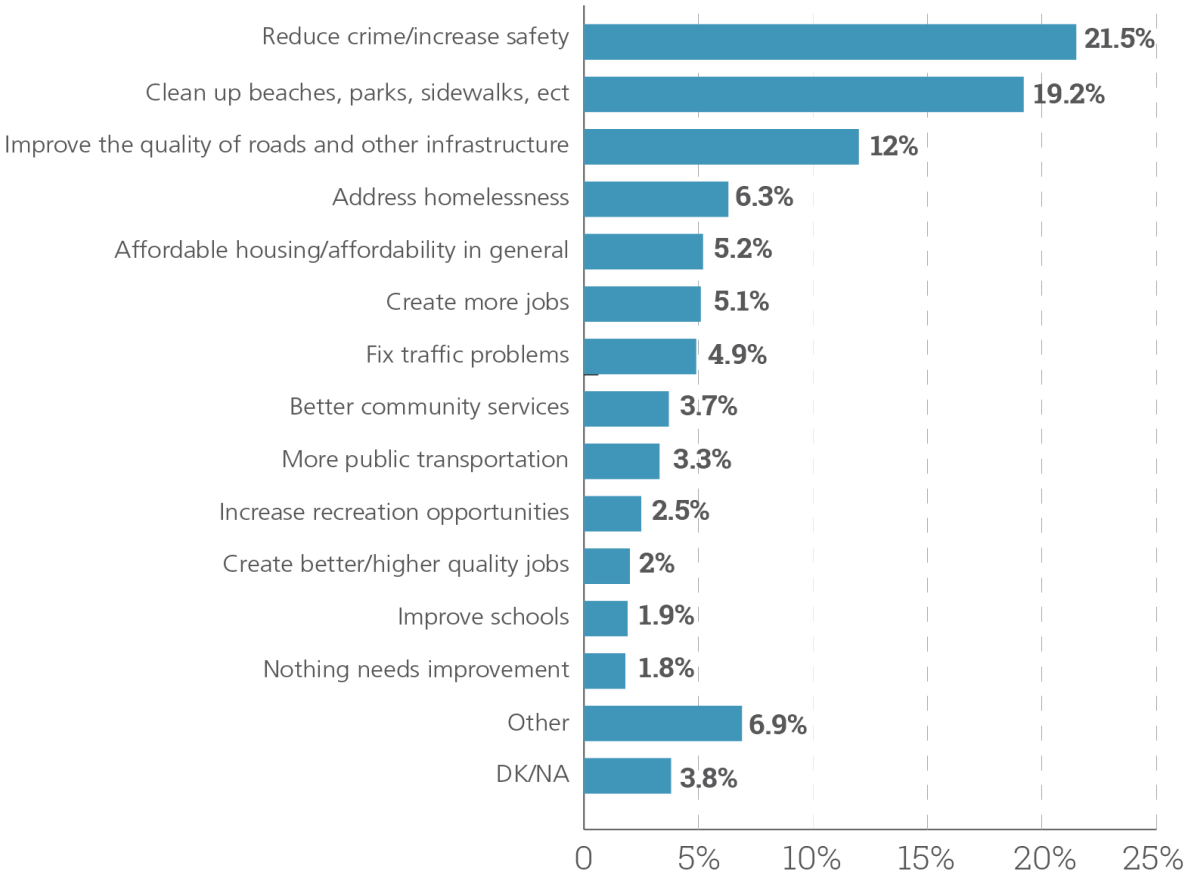


Figure 2: Most Important Thing to Improve Quality of Life

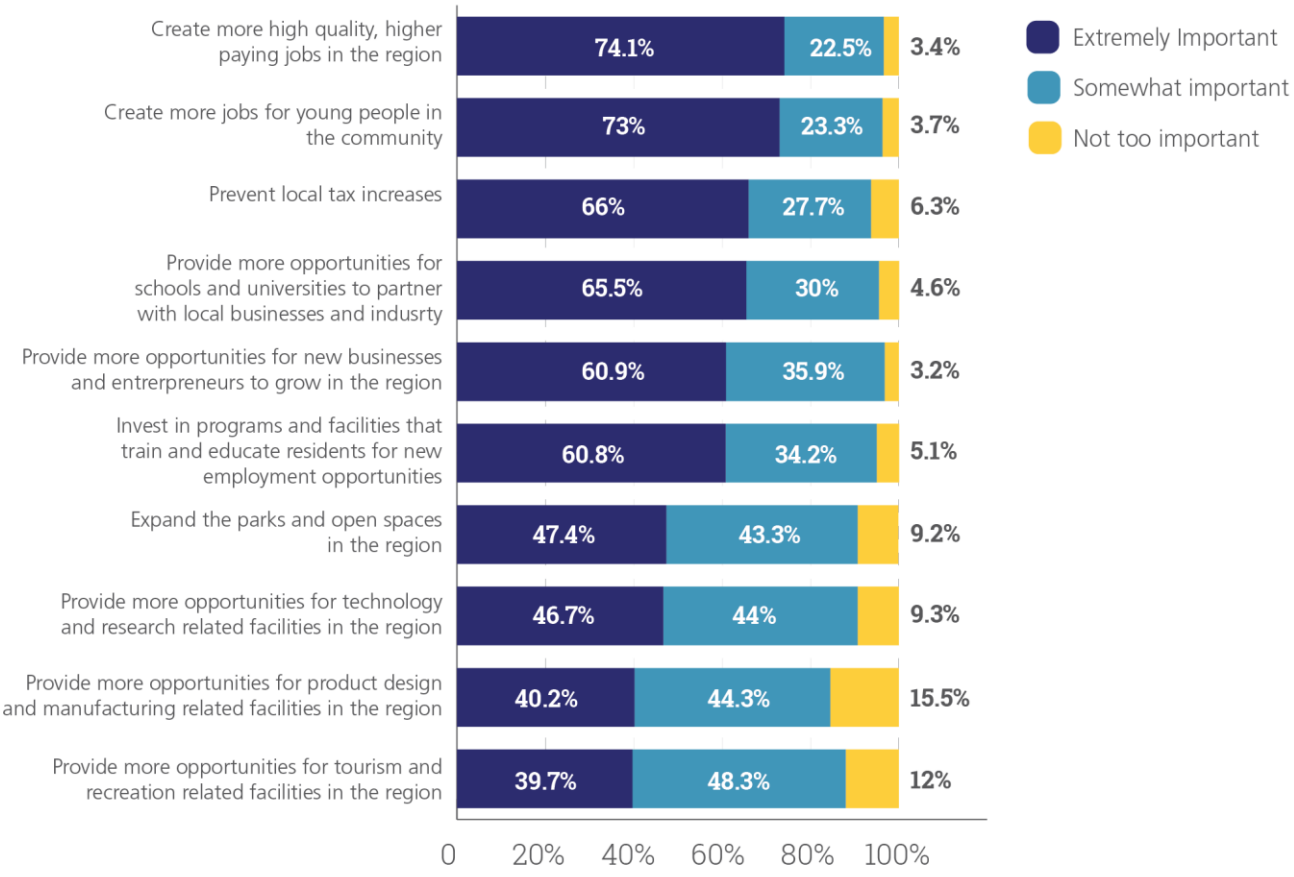


ISSUES FACING THE COMMUNITY

A majority of residents surveyed indicated that “creating more high quality, higher paying jobs in the region” (74%), “creating more jobs for young people in our community” (73%), “preventing local tax increases” (66%), “providing more opportunities for schools and universities to partner with local business and industry” (65%), “providing more opportunities for new businesses and entrepreneurs to grow in the region” (61%), and “investing in programs and facilities that train and educate residents for new employment opportunities” (61%) were “extremely important” for the community.

More than one-in-ten residents felt that “providing more opportunities for product design and manufacturing related facilities in the region” (15%) and “providing more opportunities for tourism and recreation related facilities in the region” (12%) were “not too important.”

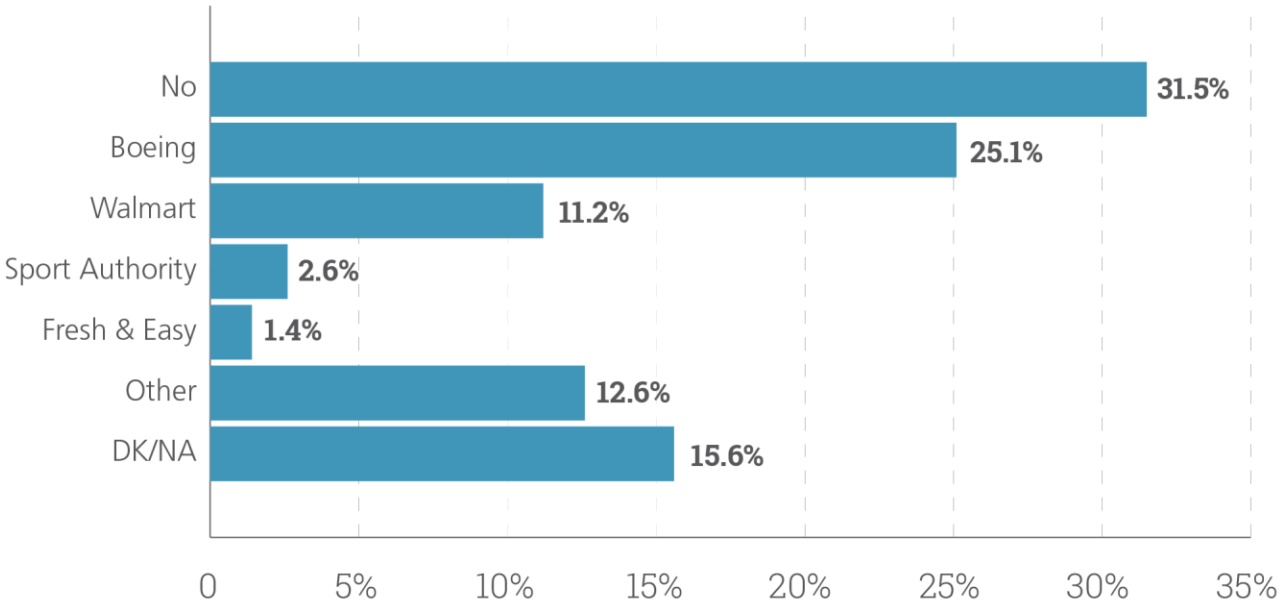
Figure 3: Importance of Various Issues



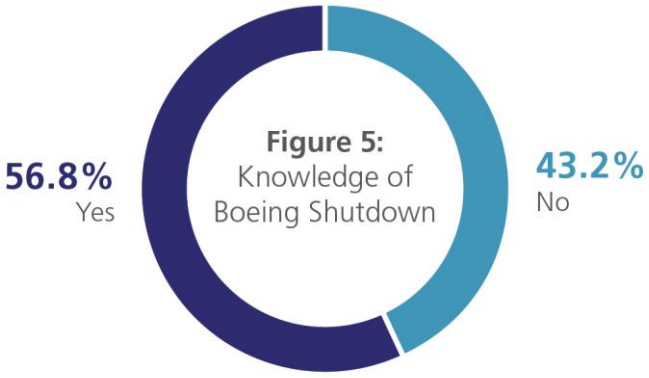
BOEING C-17 PLANT CLOSURE AWARENESS

Residents were asked to name any large companies that are shutting down or have recently closed in the greater Long Beach area. This was an unaided question, meaning that no company names were read to the survey respondents. Thirty-one percent of all surveyed residents could not name a company that had or was about to shut down in the region. Just over a quarter (25%) were aware of the Boeing closure, the largest percentage among companies that were mentioned by residents (Figure 4).

Figure 4: Knowledge of any Large Company Shutdowns in the Region



As a follow-up question, respondents were asked directly if they had knowledge of the Boeing plant closure. In all, more than half (57%) of Long Beach area residents had heard or read something about Boeing closing its facility in Long Beach and 31% indicated that they knew someone that was or will be impacted by the closure of Boeing's Long Beach facility. Approximately 77% have seen or were aware of where the old Boeing facility is located in Long Beach, near the border of Seal Beach and Long Beach.



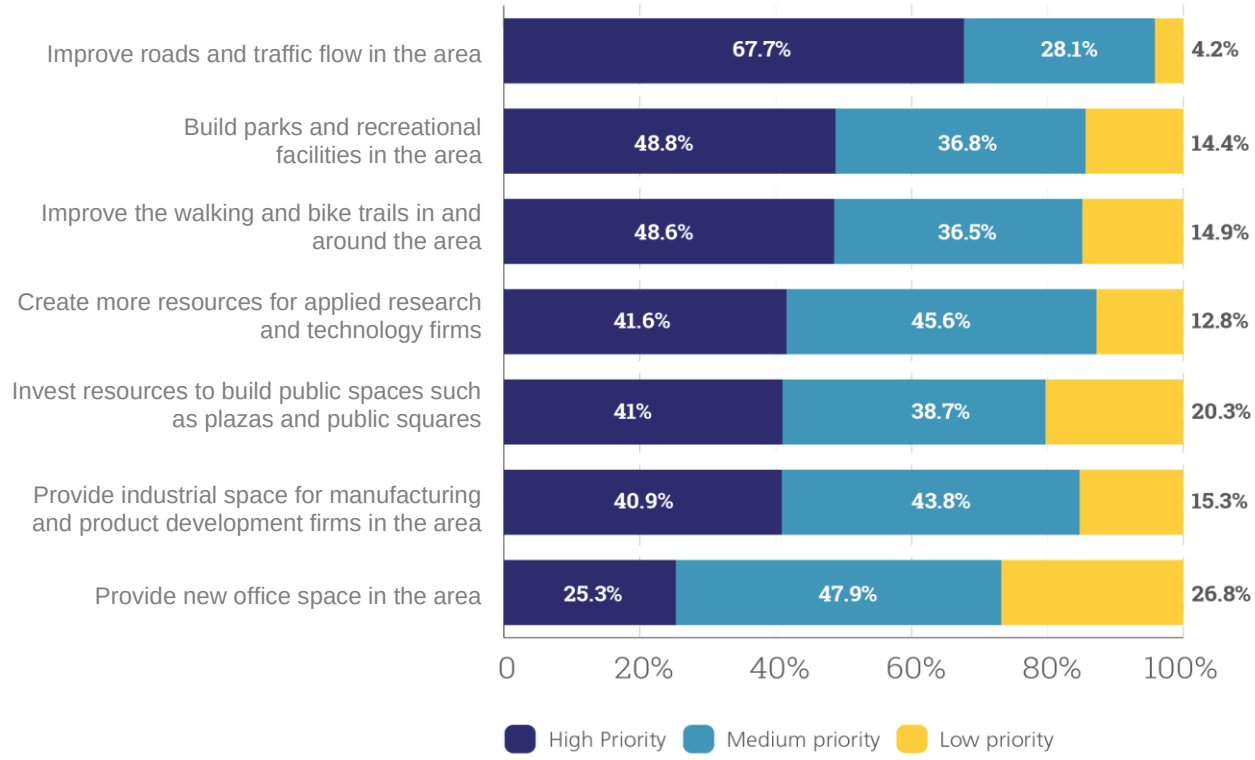
NEXT STEPS FOR THE BOEING C-17 FACILITY

Next, residents were asked about their level of support for various potential uses related to the area in and around where the Boeing facility is located. More than three quarters of residents expressed support for "developing more recreation facilities" (82%), "developing natural parks and open spaces" (82%), "developing new facilities for aerospace and defense related work" (79%), "redeveloping manufacturing facilities" (76%), and "developing a business park that is focused on applied research and product design" (76%). More than three-in-ten resident respondents said that they opposed "developing a high-end restaurant, brewery and shopping experience" (35%) and "developing more tourism facilities" (33%). However, each of the potential uses surveyed received support by at least 60% of respondents, meaning that none of the options surveyed were opposed by the majority of participants (Figure 6).

Figure 6: Support for Potential Uses for Boeing Facility

Long Beach area residents were then asked to offer their opinion on how the region should prioritize planning for the area in and around the Boeing facility. More than two-thirds of residents (68%) placed “high priority” on “improving roads and traffic flow in the area.” More than one-in-five residents said that “providing new office space in the area” (27%) and “investing resources to build public spaces such as plazas and public squares” (20%) were low priority options for redeveloping the Boeing facility.

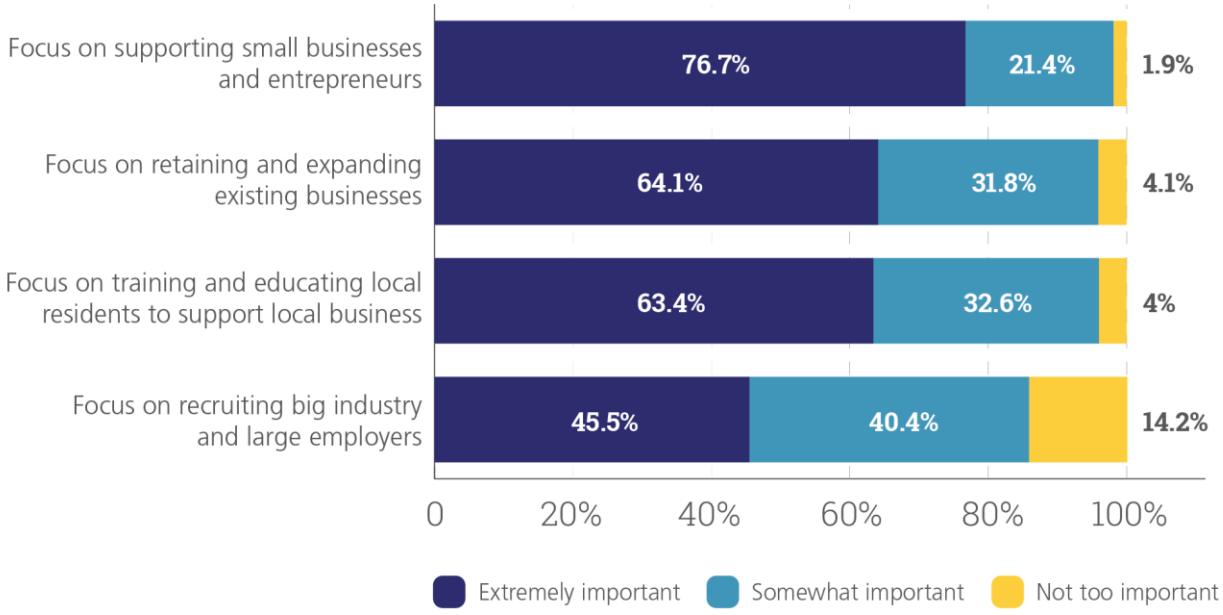
Figure 7: Level of Priority for Regional Planning Options



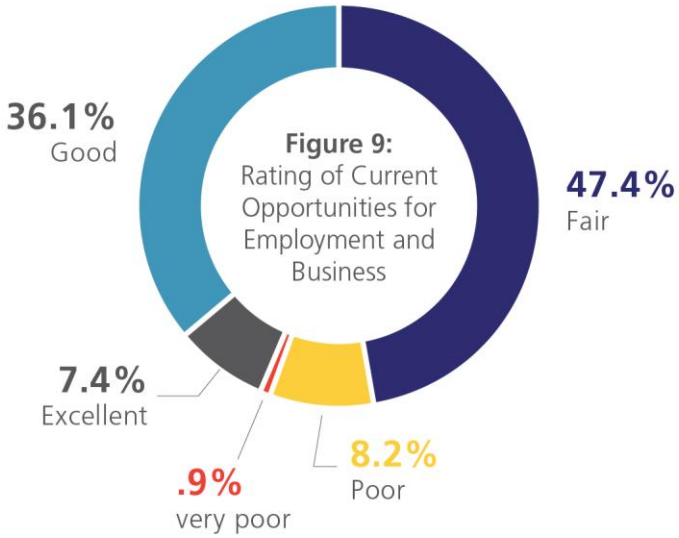
ROLE OF REGIONAL ORGANIZATIONS

Residents were asked to provide their opinion related to the role of regional organizations and the promotion of business and employment strategies. The majority of residents felt that "focusing on supporting small business and entrepreneurs" (77%), "focusing on retaining and expanding existing businesses" (64%), and "focusing on training and educating local residents to support local business" (63%) were "extremely important" strategies.

Figure 8: Importance of Various Strategies in the Region



Approximately 44% of residents feel that the opportunities for employment and doing business in the Long Beach area are at least "Good" (7%: "Excellent"; 36%: "Good").



Chapter 8

Proposed Alternatives

The C-17 Transition Program prepared preliminary concept scenarios and programs for the reuse of the existing Boeing C-17 facilities located to the west of Long Beach Airport (LGB), also known as the Boeing C-17 Study Area (Study Area). These alternatives were developed to be compatible with land use constraints related to the site's airport adjacency, promote reuse that strengthens regional industry clusters, and incorporate feedback provided by the community in charrettes and via the public opinion survey.

PRELIMINARY PROGRAM CONCEPTS BACKGROUND

To prepare the preliminary program concepts, the City hosted a charrette on August 23, 2016 to educate the public about the constraints impacting the site and to ascertain the community's priorities with respect to its reuse. At this meeting, employers, stakeholders, and members of the public reviewed an existing conditions report and then broke into small groups to develop reuse ideas and considerations. Many ideas, representing a broad spectrum of potential programs for the C-17 Study Area site, were suggested. Some of the potential alternatives advocated by the community include activity related to renewable energy, agriculture, entertainment, tourism, and residential uses.

Of the potential reuses introduced by the public, three were selected for further study by the C-17 Transition Program based on compatibility with the adjacent airport and potential to generate employment and strengthen regional industry clusters. Broadly, these ideas were clustered thematically into three areas of interest:

Table 1: Preliminary Program Concepts

PRELIMINARY PROGRAM CONCEPTS	
Fulfillment Center	This concept suggests the redevelopment of some or all of the existing facilities for large-scale distribution and perhaps assembly of goods. Long Beach, and the port in general, serves as a gateway for product distribution and fulfillment facilities were seen by some participants as a good reuse opportunity.
Manufacturing	As the site has already served as an advanced product/aircraft manufacturing site for decades, the existing facilities lend themselves to the production of aircraft, and many people felt that this use should be promoted and continued.
Innovation Campus	Many of the older manufacturing uses in the vicinity of the airport have transitioned to light industrial and knowledge work uses. These facilities typically utilize smaller structures then those on the Study Area site, and newer buildings may be designed so they can be flexibly altered for many different use types. Many people felt that the C-17 Study Area sites best lend themselves for new job space that builds upon both the existing aircraft expertise as well as contemporary uses including technology, media, and aerospace uses.

These preliminary program concepts informed the creation of land use scenarios that can accommodate a variety of jobs-producing activity. Scenario 1 and Scenario 2 were developed as follows:

- **Scenario 1: Reuse Existing Facilities:** This scenario assumes reuse of the existing hangar facilities for new industrial and/or other jobs-producing uses. The concept assumes reuse of existing roads and the use of surface parking. Two surface parking alternatives were considered. The first alternative utilized a parking ratio of two surface parking spaces for every 1,000 square feet of program area (2:1000). The second alternative assumed a more intense parking standard of four surface parking spaces for every 1,000 square feet of program area (4:1000). See Figure 1 at the end of this chapter.

- **Scenario 2 – Redevelop with New Facilities:** This scenario assumes demolition of the two major aircraft production hangars and associated facilities and redevelopment of the site with new infrastructure and new buildings housing new job-producing uses. Like Scenario 1 above, Scenario 2 also explored two alternatives shaped by an assumption of surface parking. The first alternative again utilized a parking ratio of two surface parking spaces for every 1,000 square feet of program area (2:1000). The second alternative again assumed a more intense parking standard of four surface parking spaces for every 1,000 square feet of program area (4:1000). See Figure 2 at the end of this chapter.

While the number of scenarios that could be conceived is large, these two scenarios accommodate the broad range of reuse opportunities related to future preferred use with a jobs-producing bias. These scenarios address both the desire to maintain the potential for reuse of the site for a singular aircraft use, or manufacturing/fulfillment use, as well as the vision to encourage redevelopment of the site as a type of flexible office/light industrial park or innovation campus. And, of course, the two poles of these two scenarios still allow for an in-between hybrid where some of the site could be reused as-is, while other portions of the Study Area parcels are redeveloped.

The scenarios presented in this memorandum were presented by the consultant at a September 12, 2016 public workshop held in Long Beach at which time additional input was received. This input was largely supportive of the approach and flexibility of the two scenarios presented, though all agreed that additional analysis was needed along with the development of supportive land use and economic development policies.

KEY PRELIMINARY CONCEPT SCENARIO CONSTRAINTS AND PROGRAM CONSIDERATION

The development of the preliminary scenarios was quantitatively shaped by two key constraints, one related to parking and the other related to height.

SURFACE PARKING CONSTRAINT

The consultant team anecdotally observed a variety of suburban office parks and light industrial parks and noted that they often utilize surface parking. Surrounding the Long Beach Airport area, the industrial and commercial uses, including the Douglas Park complex to the north and east of the airport runways, are surface parked. While new office parks and technology parks do incorporate structured parking, the team felt that the preference in the Long Beach airport area, for light manufacturing as well as other job uses, would be for surface parking. In the view of the consultants, to be competitive with similar projects in the district, a new project should ideally not absorb the costs of structured parking. In this last regard, scenario development assumed that the approximate 11-acre site to the east of the Study Area (identified as Lot 3 in Figure 1 and Figure 2) would be utilized as a surface parking resource for potential development.

Given that both fulfillment as well as more employee-intense uses including manufacturing and technology are of interest, the team also decided that surface parking should be tested at two different densities; 2:1000, which is typical for lower intensity uses such as warehousing and distribution, and 4:1000 which is typical for office use. At the same time a ratio of 375 square feet per parking space was used to establish the amount of total parking, circulation, and landscape that each parked car generates. This number is about 10% more than the typical area allotted for parking. In combination these criteria, the surface parking area, the Lot 3 area, and the area per parking space, together introduce constraints that limits the amount of land area available for the footprints of existing and new buildings and development.

HEIGHT CONSTRAINT

The site is located adjacent to an airport and some limits on the height of development are associated with the airport use. While towards the center of the site higher structures of approximately ten stories are allowed, towards the periphery of the site and adjacent to runways, one to four story maximum building

heights are permitted. The larger of the two Boeing hangars is located towards the middle of the Study Site Area, where taller structures are permitted. This structure is approximately 90' tall, or six commercial stories in height. Based upon observation of new one- and two-story flexible use construction in the area surrounding the airport, the bias towards establishing new job-producing uses including manufacturing, as well as consideration of the surface parking constraints and opportunities, i.e. reuse of Lot 3 for surface parking, noted above, the Urban Designer determined that the maximum average height of development should be limited to two and one-half stories. This average height acknowledges that existing long-span, one-story structures may be reused, that new construction will tend to be flexible use two-story buildings, and that some taller construction such as hotels or multi-story office structures could be developed as part of a larger project. This second constraint of height, in combination with the surface parking constraints, further defines from a quantitative standpoint the maximum development envelope.

PROGRAM CONSIDERATION

These reuse scenarios assume that a mix of supportive commercial, hospitality, and retail uses would be attracted to the Study Area as it redevelops. Like the main uses considered, the accessory and supportive uses are assumed to be surface parked. To maintain consistency across all of the scenarios and alternatives considered in this first program analysis, the following accessory program criteria were also assumed.

- 10% of the total development provided by a scenario alternative would be defined as supportive and accessory uses.
- Supportive and accessory uses would include 90,000 square feet of hospitality uses or approximately one 150 room hotel.
- The remainder of the supportive and accessory uses would consist of a mix of retail, commercial, and public uses such as but not limited to eating, general retail, specialty retail, and supportive commercial and public uses.

While this component of the program needs to be further refined, the objective of including it in the quantitative analysis of the program was to ensure that an attractive mixed-use district emerged that was desirable to tenants; realizing a jobs-producing destination and place with a distinct airport-proximate identity.

The two constraints and program consideration together, surface parking and reuse of Lot 3 for surface parking, height averaging, and mixed-use programming, create a planning framework that constrains and shapes future reuse and development of the Study Area, defining the gross environmental envelope of a potential project.

STUDY AREA SCENARIO 1: REUSE EXISTING FACILITIES

Scenario 1 assumes reuse of the two main existing hangar facilities for new manufacturing, fulfillment, or flexible office use. Additionally, supportive and accessory uses including hospitality, retail, and commercial uses would be intermixed with the job uses to realize a mixed-use jobs district with a manufacturing or fulfillment emphasis. Two alternatives were considered; Scenario 1 Alternative 1 (Scenario 1.1) incorporates surface parking at a ratio of 2:1000; Scenario 1 Alternative 2 (Scenario 1.2) incorporates surface parking at a ratio of 4:1000. Scenario 1.1 assumes a need for less parking, i.e. 2:1000, based upon the lesser employment associated with fulfillment and/or contemporary automated manufacturing. Scenario 1.2 assumes a need for more parking, i.e. 4:1000, based upon the greater employment associated with a greater emphasis on increased flexible uses including office uses. Utilizing the constraints and consideration noted above, two alternative programs are generated. The alternatives available under Scenario 1 are summarized in Table 2 below.

Table 2: Scenario 1 Land Use Specifications

Scenario 1.1 *assume 2:1000 surface parking*		**Scenario 1.2 *assume 4:1000 surface parking***	
Reuse of Existing Large Hangars	1,400,000 SF	Reuse of Existing Large Hangars	1,400,000 SF
Hotel	90,000 SF/150 keys	Hotel	90,000 SF/150 keys
Retail/Commercial	265,000 SF	Retail/Commercial	158,000 SF
Additional Job Space	999,000 SF	Additional Job Space	20,000 SF
Total Development Program	**~2,750,000 SF**	**Total Development Program**	**~1,675,000 SF**
Surface parking	3,500 spaces	Surface parking	6,650 spaces

Both Scenario 1 alternatives result in the development of job space, though as one increases the surface parking available, this increased parking area results in a consequent decrease in the site area available for any job space development in addition to the reused hangars. The other finding that this scenario illustrates is that the 2:1000 parking ratio of Scenario 1 Alternative 1 allows for almost 1,300,000 square feet of additional development. However, this development is contemporary, and may require a greater number of parking spaces given the "suburban" location and relative lack of present transit and mobility access to the Study Area.

STUDY AREA SCENARIO 2: REDEVELOP WITH NEW FACILITIES

Scenario 2 assumes that existing facilities are replaced new buildings containing predominantly jobs-producing uses including a range of flexible light manufacturing, fulfillment, knowledge work, technology, and media uses. Additionally, supportive and accessory uses including hospitality, retail, commercial, and retail uses would be intermixed with the jobs uses to realize a mixed-use innovation district or campus environment. Two alternatives were considered; Scenario 2 Alternative 1 (Scenario 2.1) incorporates surface parking at a ratio of 2:1000; Scenario 2 Alternative 2 (Scenario 2.2) incorporates surface parking at a ratio of 4:1000. Scenario 2.1 assumes a need for less parking, i.e. 2:1000, based upon an employment level associated with more light manufacturing uses. Scenario 1.2 assumes a need for more parking, i.e. 4:1000, based upon an employment level associated with a greater emphasis on knowledge work. Utilizing the constraints and consideration noted in above, the two programs summarized in Table 3 are generated.

Table 3: Scenario 2 Land Use Specifications

Scenario 2.1 *assume 2:1000 surface parking*		**Scenario 2.2 *assume 4:1000 surface parking***	
Job Space	3,100,000 SF	Job Space	1,900,000 SF
Hotel	90,000 SF/150 keys	Hotel	90,000 SF/150 keys
Retail/Commercial	261,000 SF	Retail/Commercial	122,000 SF
Total Development Program	**~3,450,000 SF**	**Total Development Program**	**~2,750,000 SF**
Surface parking	7,010 spaces	Surface parking	8,500 spaces

Both Scenario 2 alternatives result in the development of job space, though as one increases the surface parking available, this increased parking area results in a consequent decrease in the site area available for any job space development, i.e. new buildings. The main advantage of Scenario 2 is that it probably allows for a greater variety of jobs producing uses as it is not constrained by an assumed reuse of the existing aircraft production hangars. Like Scenario 1, the other finding that this scenario illustrates is that the 2:1000 parking ratio of Scenario 2 Alternative 1 allows for approximately 3,450,000 square feet of development, which will generate, if successful, work for many people. However, this intensity of development is contemporary, and may require a greater number of parking spaces given the “suburban” location and relative lack of present transit and mobility access to the Study Area and surrounds.

This chapter summarized four distinct land use alternatives. The next chapter will discuss their fiscal impact.

Figure 1: Land Use Scenario 1

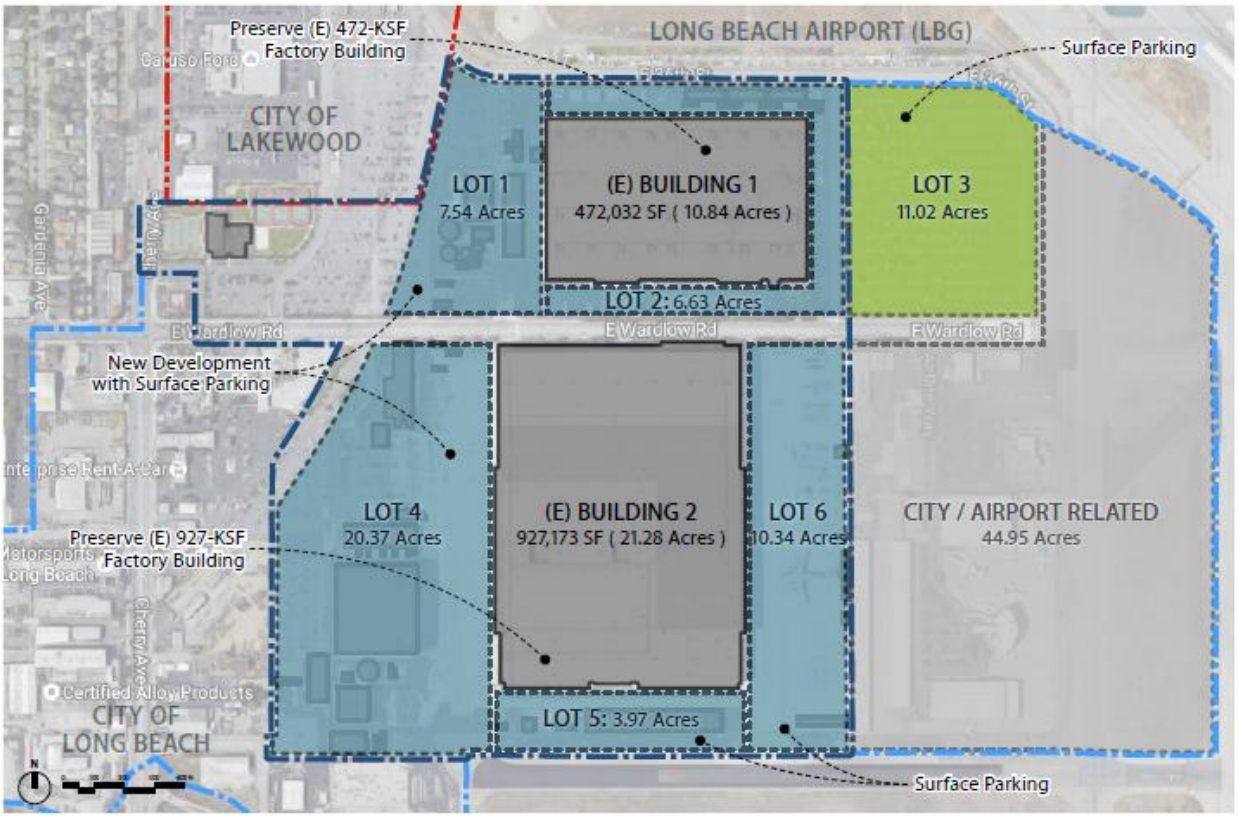
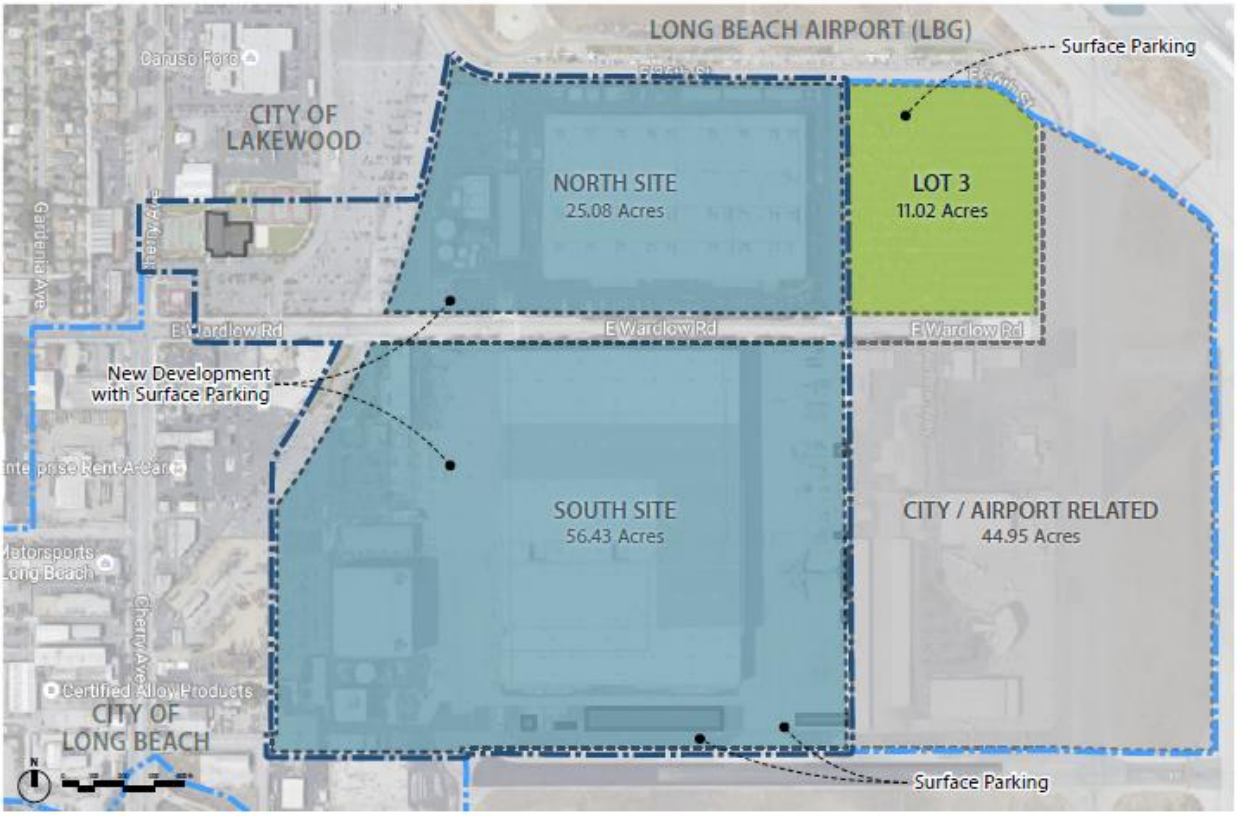


Figure 2: Land Use Scenario 2



Chapter 9

Fiscal Impact Analysis

This chapter presents a fiscal analysis of the four land use alternative scenarios presented in Chapter 8. The discussion begins with a description of the economic characteristics of the project alternatives that are relevant to the calculation of City costs and revenues. The chapter then describes the methodology used in the fiscal analysis and concludes with a presentation of the findings relative to each alternative.

DESCRIPTION OF ANALYSIS

Table 1 below shows the specific assumptions used in the fiscal analysis for each of the project scenarios, in terms of building square footage by land use, direct on-site jobs, and estimated assessed value for the development. The jobs are estimated using per square foot employee density factors, obtained from surveys conducted by the Southern California Association of Governments (SCAG), among other sources.[21] For purposes of the fiscal analysis, these job estimates do not include any off-site indirect or induced multiplier jobs. The estimates of assessed value for the new development are based on analysis of non-residential development projects constructed within the last five years in Los Angeles County, accessed through the CoreLogic property database. Based on this analysis, the general assessed value factors per building square foot shown in Table 2 were derived.

METHODOLOGY

This methodology employs an "average cost" approach to the fiscal impact analysis. A review of Long Beach's General Fund budget (Table 3) identified the various city services that may be affected by the project alternatives. This fiscal model estimates that in Long Beach, non-residential development consumes about 15% of City operations and maintenance services, and residential the balance at 85%. This is based on a standard industry assumption that non-residential land uses, as represented by the number of jobs they support, require half the level of municipal services as do full time residents.

Table 1: Description of Project Alternatives

Land Use	*Bldg. Sq. Ft.*	*On-site Jobs*	*Assessed Value*
Scenario 1.1			
Retail	133,500	243	42,052,500
Services	133,500	243	42,052,500
Office	-	-	-
R&D Office	1,017,872	3,393	236,146,398
Manufacturing	770,403	1,101	161,245,387
Fulfillment Center	610,724	611	84,890,692
Hotel	90,000	78	28,620,000
Total	**2,756,000**	**5,668**	**595,007,478**
Scenario 1.2			
Retail	79,000	144	24,885,000
Services	79,000	158	24,885,000
Office	20,300	68	4,709,600
R&D Office	594,006	1,980	137,809,486
Manufacturing	449,589	642	94,099,017
Fulfillment Center	356,404	356	49,540,212
Hotel	90,000	78	28,620,000

[21] The Natelson Company and Terry A. Hayes Associates, Employee Density Summary Report. 2001. SCAG.

Total	**1,668,300**	**3,426**	**364,548,316**
Scenario 2.1			
Retail	130,260	237	41,031,743
Services	130,260	261	41,031,743
Office		-	-
R&D Office	1,506,139	5,020	349,424,177
Manufacturing	1,140,212	1,629	238,646,465
Fulfillment Center	903,649	904	125,607,191
Hotel	90,000	78	28,620,000
Total	**3,900,519**	**8,129**	**824,361,319**
Scenario 2.2			
Retail	61,078	111	19,239,570
Services	61,078	122	19,239,570
Office		-	-
R&D Office	810,090	2,700	187,940,993
Manufacturing	613,274	876	128,358,186
Fulfillment Center	486,036	486	67,558,978
Hotel	90,000	78	28,620,000
Total	**2,121,556**	**4,374**	**450,957,297**

Source: ADE, Inc.

Table 2: Job and Assessed Value Calculation Factors

Land Use	*Bldg. Sq. Ft. per Job*	*Assessed Value per Building Sq. Ft.*
Retail	550	$315.00
Services	500	315.00
Office	300	232.00
R&D Office	300	232.00
Manufacturing	700	209.00
Wholesale	1,000	139.00
Hotel	1,150	$318.00

Source: ADE, Inc.

Table 3: Long Beach General Fund Budget, FY 2016-2017

Budget Category	*Annual Budget*
Revenues	
Taxes	
Property Tax	$108,331,939
Property Tax in lieu of VLF	$45,872,400
Utility Users Tax	$40,692,608
Sales Tax: General	$58,848,000
Sales Tax: Measure A	$35,640,000
Transient Occupancy Tax	$19,261,000
Franchise Fees	$11,274,508
Business License Tax	$12,357,000
Real Property Transfer Tax	$2,139,060
Intergovernmental	$2,433,962
Charges for Service	$60,313,478
Asset Management	$6,867,495
Miscellaneous Revenues	$3,025,200
Transfers in	$21,611,514
Other	$15,594,397
TOTAL REVENUES	**$459,044,679**
Expenditures	
General Government	$90,672,115
Police Dept.	$197,596,129
Fire Services	$91,171,404
Public Works	$37,783,838
Parks/Rec/Marine	$32,526,369
Economic Development	$1,970,226
Development Services	$5,122,044
Library	$12,888,265
TOTAL EXPENDITURES	**$469,730,390**
TOTAL NET	**($10,685,711)**

The average cost approach yields a more conservative analysis because it includes all City expenditures in the cost basis and does not assume existing City services would be able to serve the project without expansion. In reality, the City was providing municipal services to the Boeing operation, so it is likely new

uses with similar service demands would not require increases in City service expenditures. However, some of the project alternatives represent a more intensive use of the site and would likely require a higher level of City services. The average cost factors per employee for City services are shown in Table 4 below.

Table 4: City Service Per Capita Cost Factors

Department	*Per Job Annual Cost*	
Police Dept.	$139.05	- $260.72
Fire Services	$68.17	(Medical response)
Public Works	$23.84	
Parks/Rec/Marine	$0.00	
Economic Development	$11.81	
Development Services	$4.51	

The higher police cost factor is for retail uses, which typically have higher potential for crime incidents than other types of businesses. Fire services are split between emergency medical response and fire response. The latter service is assumed to represent 15% of fire department operations and is calculated as a function of building valuation rather than per employee.

In addition to these direct service charges, the City management and administrative departments provide support to the direct service departments. Based on the budget figures in Table 3 above, these General Government functions represent about 24.6% of direct service department costs and this has been added as a cost component in the analysis.

In terms of General Fund revenues to help offset the service costs, the project would generate property tax for the City and some of the land uses, particularly retail, would generate sales tax. In addition, the City has various other taxes and also charges fees for direct services that help fund municipal services, as shown in the upper part of Table 3.

Property Tax. For every dollar that property owners pay in property taxes, the City of Long Beach receives an average of $0.22. The other property tax revenues are shared by the County of Los Angeles, the school districts and a variety of other taxing agencies with jurisdiction over the project site. However, the City also receives an additional amount of property tax in lieu of vehicle license fees under a statewide program in effect since 2004. This secondary property tax source amounts to 42% of the base property tax the City receives.

Sales Tax. The retail uses in the project would generate sales tax and to some extent additional sales taxes may be generated by the fulfillment center or even the manufacturing uses, depending on the businesses that occupy that space. Statewide, about 30% of all sales taxes are generated by non-retail businesses. The City receives one percent of the taxable sales value for purchases within its jurisdiction. In addition, Long Beach as recently adopted Measure A that is projected to add another 60% to the City base sales tax revenues.

Transient Occupancy Tax (TOT). The City collects a tax of 12% on room revenues for lodging within its jurisdiction. With a little more than 6,000 hotel rooms in the City, each room generates about $3,200 per year in TOT revenues for the City.

Other Revenues, including the utility users tax, business license tax, franchise fees and direct charges for service have been estimated in the analysis on a per capita basis depending on the number of jobs in each project scenario.

FINDINGS OF THE ANALYSIS

The cost and revenue factors described above were used to estimate the potential fiscal impact to the City of Long Beach for each Project Alternative. The results of the analysis are summarized in Table 4, with more detailed figures provided in Table 5. The cost estimates relate to annual operating and maintenance costs for City services and do not address capital improvements that may be needed to support implementation of the project alternatives. Table 6 below estimates the capital improvement fees that each alternative would generate to help pay for any capital improvements that may be needed. As indicated in Table 4, the annual costs range from about $1.2 million for Scenario 1.2 to nearly $2.8 million for Scenario 2.1. However, all of the alternatives are projected to generate sufficient revenue for the City General Fund to more than pay for the City service expenditures. In fact, Scenario 2.1, which has the highest costs, also has the highest revenue and would potentially generate a net surplus of revenue of $5.7 million per year.

Table 4: Summary of Fiscal Impact by Project Scenario

Budget category	*Scenario 1.1*	*Scenario 1.2*	*Scenario 2.1*	*Scenario 2.2*
Costs	$1,947,417	$1,175,537	$2,772,845	$1,488,432
Revenues	$6,288,940	$3,987,618	$8,440,017	$4,741,824
Net Fiscal Surplus/(Cost)	$4,341,523	$2,812,081	$5,667,173	$3,253,392

Comparing the scenario characteristics in Table 1 above with the detailed fiscal calculations in Table 5, the project alternatives with the higher job counts create higher levels of service demands for the City and higher costs. Thus, Scenarios 1.1 and 2.1 have higher costs than the other two scenarios. However, these two scenarios also have larger building footprints and therefore create higher levels of property taxes. Scenarios 1.1 and 2.1 also have more retail space, which generates sales taxes. Across all the scenarios, property taxes, sales taxes and hotel taxes comprise 80 percent of the total estimated revenues.

Table 5: Detailed Estimates of City Costs and Revenues by Project Scenarios

Budget Category	*Scenario 1.1*	*Scenario 1.2*	*Scenario 2.1*	*Scenario 2.2*
Revenues				
Property Tax	$1,288,804	$789,623	$1,785,591	$976,787
Property Tax in lieu of VLF	545,735	334,360	756,096	413,614
Utility Users Tax	202,886	122,645	290,967	156,566
Sales Tax: General	1,730,624	1,036,046	2,302,822	1,211,444
Sales Tax: Measure A	1,048,114	627,458	1,394,654	733,684
Transient Occupancy Tax	480,804	480,804	480,804	480,804
Franchise Fees	56,213	33,981	80,617	43,379
Business License Tax	419,661	253,685	601,853	323,851
Fines and Forfeitures	73,701	44,552	105,698	56,875
Charges for Service	300,712	181,780	431,263	232,058
Miscellaneous Revenues	10,654	6,218	15,765	8,479
Transfers in	76,112	44,417	112,621	60,574

Other	54,921	32,050	81,265	43,709
Total Revenues	**$6,288,940**	**$3,987,618**	**$8,440,017**	**$4,741,824**
Expenditures				
General Government	$384,662	$232,197	$547,704	$294,001
Police Dept.	817,941	494,093	1,159,517	621,929
Fire Services/Emer. Prep.	392,848	237,394	560,434	301,126
Public Works	215,747	129,509	309,832	166,255
Economic Dev	66,912	40,448	95,961	51,635
Development Services	25,538	15,437	36,624	19,707
Library	43,770	26,459	62,773	33,777
Total Expenditures	$1,947,417	$1,175,537	$2,772,845	$1,488,432
Net Revenue/(Cost)	**$4,341,523**	**$2,812,081**	**$5,667,173**	**$3,253,392**

As mentioned above, in addition to annually recurring costs, off-site capital improvements may be needed to expand streets, intersections, water and sewer mains and other public facilities to support the implementation of the project alternatives. Table 6 presents one-time revenues generated via development impact fees, which are intended to cover off-site improvements needed to support the project.

At this point, there is not information on off-site improvements needed as a result of any one of the four scenarios. But the development impact fee estimates presented here indicate how much the City should obtain from any of the four scenarios to deal with off-site improvements. These fees would be paid by a developer wishing to implement any of the alternatives. If the costs of off-site improvements turn out to be higher than the development impact fees collected, then it is possible the City would negotiate to have the developer pay the additional cost as well.

Table 6: Estimated Development Impact Fees by Project Scenario

Fee Category	*Fee*	*Scenario 1-A*	*Scenario 1-B*	*Scenario 2-A*	*Scenario 2-B*
Fire Facilities					
Commercial	$0.267	$71,300	$47,600	$69,600	$32,600
Industrial	$0.132	$316,700	$184,800	$468,600	$252,000
Police Facilities					
Commercial	$0.442	$118,000	$78,800	$115,100	$54,000
Industrial	$0.218	$523,000	$305,200	$773,900	$416,200
Schools					
Commercial	$0.56	$1,543,400	$934,200	$2,184,300	$1,188,100
Transportation Improvements					
Commercial	$1.10	$293,700	$196,100	$286,600	$134,400
Industrial	$3.00	$7,197,000	$4,200,000	$10,650,000	$5,728,200
Hotel	$750.00	$112,500	$112,500	$112,500	$112,500
Off-site Runoff	$3.02	$8,323,100	$5,099,600	$11,779,600	$6,407,100
Total		**$18,498,700**	**$11,158,800**	**$26,440,200**	**$14,325,100**

CONCLUSION

Each of the project scenarios designed in this process for the Boeing C-17 site would create a positive net fiscal impact for the City of Long Beach, in addition to creating jobs to replace those lost from the Boeing plant closure. The more intensively the site is reused, the higher the likely fiscal benefit from the standpoint of annual ongoing services and related General Fund tax and fee revenues. However, it may be expected that more intensive site development would also increase the need for capital improvements to expand infrastructure in the vicinity of the project site, which may affect the financial feasibility of redeveloping the site.

Section IV – Conclusion

Chapter 10

Next Steps

The loss of the Boeing C-17 final assembly facility in Long Beach presents a significant challenge to the local and regional economy. However, through continued refinement of the C-17 Transition Program, the City aspires to leverage this loss into an opportunity for Long Beach to develop as a center of employment and grow as a leader of innovation in the Southern California. The development of the C-17 Transition Master Plan is only the first step in a journey toward achieving these goals. Although Boeing retains ownership of the C-17 site, the City will continue to work proactively to ensure that the facilities are reused or redeveloped in a manner that is consistent with the primary mission of the C-17 Transition Program: to addresses both the short-term needs of the dislocated workers and the long-term economic development needs of the region. To uphold this, several key actions are recommended. These are briefly discussed in this chapter.

RECOMMENDED ACTIONS

Continue to involve the community. The participation of local businesses, residents, former Boeing employees, and other stakeholders was vital to the development of the *C-17 Transition Master Plan*. Ultimately, the best ideas about how to shape the future of a community come from its members. The City of Long Beach will continue to engage the public as it implements and adjusts the C-17 Transition Master Plan. Specifically, the C-17 Transition Program's website (www.pacific-gateway.org/C-17) will remain up to date with information about its progress for those members of the public wishing to stay involved.

Engage the region. Although the former Boeing C-17 site is located in the City of Long Beach, the effects of its closure are felt in neighboring communities and across Southern California. Similarly, the success of the site's redevelopment will be dependent in part on factors beyond the City's jurisdiction. In many ways, economies operate at the regional level. Depending on the opportunities that arise, the City of Long Beach may wish to consider regionalism as a strategy to achieve synergistic growth for its residents and those in neighboring communities.

Promote workforce development for strong industry clusters. The industry clusters identified in this report account for approximately one-third of all employment in the Long Beach region and approximately half of all job growth. In order to attract and retain these high growth businesses, it is critical that the City continue to prioritize workforce development relevant to the hiring needs of these industries. Employers surveyed under the C-17 Transition Program identified skills gaps as their most significant hiring barrier. Similarly, respondents to a survey of dislocated workers in the region reported that a lack of experience, skills, or tools is the most significant obstacle to being hired to their preferred position. The City may consider ways to align workers that feel they are lacking skills to training opportunities, for example by working with employers in high-growth industries to develop recognized credentials or curricula.

Identify resources. To promote successful implementation of the strategies outlined in the *C-17 Transition Master Plan*, it is necessary to first identify the resources available for this purpose. The intent of the C-17 Transition Program is to meet the needs of impacted defense firms and workers and to promote economic growth in Long Beach through the redevelopment of the C-17 site. Conducting an asset mapping of the resources that already exist in Long Beach and the surrounding region may lead to increased efficiency as the City pursues these objectives.

Learn from others. The military is allocated more money in the federal budget than any other discretionary program combined. Given the volume of Defense funding, it is no surprise that many local and regional economies across the United States are dependent on military spending. However, the volatility of budgetary allocations leaves these communities vulnerable in the event of a base closure or the loss of a prime contractor. The City of Long Beach can learn from the example of other localities that have successfully navigated this transition. Case studies of communities that successfully diversified their economies away from defense dependency or that repurposed a former defense facility were developed as part of research effort of the C-17 Transition Program. These case studies are provided in Attachment A. The City of Long Beach should continue to seek examples of successful defense industry adjustment.

Encourage innovation. One of the best ways to grow the presence of innovative companies to Long Beach is to grow them in the City's backyard. As part of the case study research discussed above, City staff and others contributing to the C-17 Transition Program traveled to Massachusetts to learn about their efforts to diversify their manufacturing industry. Part of this effort included funding for Greentown Labs, an incubator for entrepreneurs in the field of renewable energy that operates from a repurposed factory space. The City should explore similar strategies to support innovation and entrepreneurship in Long Beach. Regardless of whether this initiative utilizes the former C-17 site or other facilities, it will promote the strength of regional industry clusters through the development of locally grown business.

Appendices

Appendix A: Similar Site Case Studies

Alameda Naval Air Station	
Site Type	Base Realignment and Closure (BRAC)
Geography	California, Alameda County
Residential Population	1,443,741 (Alameda County, Year 2000)
Employment	(Year 2015) – 574,694
Employment Composition	
(2016 Q2) – The region's top industries that account for 44 percent of total employment include: Healthcare and Social Assistance (14 percent); Professional, Scientific, and Technical Services (11 percent); Manufacturing (9 percent); and Retail Trade (9 percent). Professional, Scientific, and Technical Services are especially concentrated in the County compared to the national average, with a location quotient of 1.63. Healthcare and Social Assistance as well as Professional, Scientific, and Technical Services are projected to grow the fastest over the next five years, about two percent each.	
Timeline	
1936-1997, designated for closure in 1993, 2016 City gains title to 1,379 acres of land and water and plans to develop "Alameda Point" (consisting of commercial space, park and open space, mixed-income housing, new ferry terminal) to improve infrastructure and support future business investments and attractions.	
General Economic Impact	
Along with the expected civilian job losses as well as military personnel, the closure of the Alameda Naval Air Station created a ripple effect throughout local economies, negatively impacting housing values, retail sales, secondary employment, and tax revenue. With plans to redevelop the base, a general positive economic impact can be expected with new permanent jobs as well as temporary jobs in construction, but delays in conveying the land hinder economic productivity including lengthy property transfer processes and environmental clean-up. With the city's most recent advancements of "Alameda Point", a positive economic impact can be expected as the plan furthers in its stages of development.	
Assessment	
In comparison to the closing of the Boeing plant in Long Beach, the closure of the Alameda Naval Air Station exposes the possibilities of revamping a station dedicated to Aerospace. It poses the difficulties in expecting a quick return in jobs and economic improvements being that development takes time to implement any proposed plan. The C-17 plant in Long Beach is privately owned by Boeing while the Alameda NAS is owned by the U.S.; the expectations of finding benefits to the city will differ and is predicted to be a more difficult process in ensuring a return in jobs and improvements in infrastructure.	

San Diego Naval Training Center	
Site Type	BRAC
Geography	California, San Diego County
Residential Population	2,813,833 (San Diego County, Year 2000)
Employment	(Year 2015) – 1,093,507

Employment Composition
(2016 Q2) – The region's top industries that account for 44 percent of total employment include: Healthcare and Social Assistance (13 percent); Accommodation and Food Services (11 percent); Retail Trade (10 percent); and Professional, Scientific, and Technical Services (10 percent). Professional, Scientific, and Technical Services are especially concentrated in the County compared to the national average, with a location quotient of 1.50. Healthcare and Social Assistance (two percent) as well as Professional, Scientific, and Technical Services (one percent) are projected to grow the fastest over the next five years.

Timeline
1923-1997, BRAC year 1993, city adopts redevelopment project in 1997 yet did not receive property until 2000 where it was turned into a historical site along with retail (restaurants, crafts, farmers' markets) and commercial uses (offices, live/work space) along with housing developments in 2002

General Economic Impact
As the military industry is a major contributor to San Diego's economy, the closing of the Naval Training Center affected not only military and civilian personnel but also the attributions made annually to the local economy. In the Navy's proposed budget in 1994, it was recorded that in annual payroll alone NTC contributed almost $80 million per year to San Diego's economy. In addition, visitors from out of town who came to graduations at NTC contributed almost $7 million annually to local economy. With its reuse as a historical site, NTC draws tourist attention allowing slight growth in local economy. However, additional renovations towards NTC's reuse plan are constantly being made to improve San Diego's economy through more commercial developments.

Assessment
The closure of the San Diego Naval Training Center shares similarities to Boeing's closure of the Long Beach C-17 plant in that the city's considerable number of jobs and advancements in military involvement as well as educational training for careers is strong. With the loss of jobs and training opportunities at the San Diego NTC, the City Redevelopment Agency quickly adopts the NTC Redevelopment Project Area within the same year as the training center's closure. The quick actions taken allowed the area to flourish economically through the development of retail marketplaces, commercial usage, and housing units. A similar approach can be taken towards the closure of the Boeing plant in Long Beach, however, the city may not be able to act as quickly due to the plant's ownership by the multinational corporation.

Puget Sound (Seattle) Naval Station at Sand Point	
Site Type	BRAC
Geography	Washington, King County
Residential Population	1,737,034 (King County, Year 2000)
Employment	(Year 2015) – 1,028,645

Employment Composition
(2016 Q2) – The region's top industries that account for about four in ten jobs include: Healthcare and Social Assistance (12 percent); Retail Trade (10 percent); Professional, Scientific, and Technical Services (10 percent); and Manufacturing (8 percent). Management of Companies and Enterprises are especially concentrated in the County compared to the national average, with a location quotient of 1.56. Healthcare and Social Assistance (two percent) as well as Information (two percent) are projected to grow the fastest over the next five years.

Timeline
1939-1995, BRAC year 1991, 1973 National Oceanic and Atmospheric Administration received 116 acres, 1977 City of Seattle received 198 acres becoming Magnuson Park, and 1993 City Council adopted the Community Preferred Reuse Plan for Sand Point dividing the base into six activity areas including Magnuson Park Open Space/Recreation Expansion Area and further improvements with inclusion of sports fields

General Economic Impact
With high numbers of military employees, the closing of the Puget Sound Naval Station at Sand Point affected military retirees in the Seattle area yet did not have much of a significant impact on the Seattle economy. Taking away access to nearby commissaries, exchange or medical clinics, the closure shuffled and scattered many of the military workers in the county around the region, generating short-term effects with regards to housing and retail in Sand Point's local economy. In Seattle's larger economy, there was not much change in a positive or negative manner.

Assessment
In comparison to the closing of Boeing's C-17 Plant in Long Beach, the closure of the Puget Sound Naval Station at Sand Point suggests an alternate redevelopment plan possible for Boeing to administer. The station at Sand Point was creatively split between the National Oceanic and Atmospheric Administration, the City of Seattle, and the U.S. Navy within the years leading to its closure. This same strategy could assist in the transition of redeveloping the Long Beach area as ownership of the C-17 plant is private. Contrasting with the process of Boeing's plant closure, the county found additional use to the station prior to the closing of Puget Sound Naval Station allowing an easier economic transition for the community. This somewhat stable development which Sand Point experienced may not be expected with Long Beach due to its private ownership as well as the usage of time in preparation for its closing.

Philadelphia Naval Shipyard	
Site Type	BRAC
Geography	Philadelphia, Pennsylvania
Residential Population	1,526,006 (Philadelphia County, Year 2000)
Employment	(Year 2015) – 514,192

Employment Composition
(2016 Q2) – The region's top industries that account for just over half of total employment include: Healthcare and Social Assistance (23 percent); Educational Services (11 percent); Accommodation and Food Services (11 percent); and Retail Trade (7 percent). Healthcare and Social Assistance are especially concentrated in the County compared to the national average, with a location quotient of 1.65; this industry is also expected to grow the fastest over the next five years (1.5 percent).

Timeline
1799-1996, BRAC year 1991, Philadelphia Mayor and Philadelphia Industrial Development Corporation led creation of a "Community Reuse Plan" which was submitted to Navy in 1994. New master plan established in 2004 to develop "Philadelphia Navy Yard". The Navy retained properties including a submarine propeller casting and machining facility, research and development facilities for ship propulsion systems engineering, and The Reserve Basin which acts as storage of mothballed ships. Buildings were registered as historic, green space was developed, new construction for commercial shipbuilding facility for Kvaerner, roads, and biotechnology research/development and fabrication facility, as well as mixed-use buildings for office and retail space.

General Economic Impact
Being Philadelphia's largest manufacturing plant, the closure of the Philadelphia Naval Shipyard created a ripple effect to the area's economy. With the loss of many of the area's factory jobs during this time, about a quarter of its population moved away affecting employment, crime, and education. Shipbuilding had been a part of the area's economy since the 18th Century and with its direct ties, the closure cost the city 18,000 jobs with an annual loss of more than $180 million in direct income and $56 million in state and local revenue. Improvement in the city's economy did not begin until plans to reuse and redevelop the base formed to create a Historic District with attractions for tourists, commercial spaces, roads, green space, and facilities for research and development.

Assessment
Similar to Boeing's C-17 Plant in Long Beach, the Philadelphia Naval Shipyard employed many civilians, establishing the community's economic dependency on the yard. With its closure, job losses were suffered, but to continue work in 1997 an agreement was formed with Kvaerner, a Norway-based engineering and construction services company, to renovate and modernize the shipyard with an expected total of at least 6,000 jobs, both direct and indirect. Even with this project's total job impact, a new master plan had to be formed in order to allow the community to benefit further. The creation of the plan to develop "Philadelphia Navy Yard" included a Historic District, green space, roads, research facilities, and mix-use buildings for office and retail space. This suggests that changing ownership of the Long Beach plant to either a private company or to the city may not be enough economically for success in the county. With the location of the C-17 Plant, choosing to develop retail space or retain the property to continue construction of Aerospace supplies may not benefit the community as much as combining the possible redevelopments similarly to the Philadelphia Naval Shipyard.

San Diego (General Dynamics, Kearny Mesa)	
Site Type	Defense Industry Adjustment (DIA)
Geography	California, San Diego County
Residential Population	2,813,833 (San Diego County, Year 2000)
Employment	(Year 2015) – 1,093,507

Employment Composition
(2016 Q2) – See Location 2 above for San Diego County industry composition.

Timeline
1953-1996, announced discontinue of operations at San Diego plant in 1994 resulting in loss of around 1,900 jobs. Initially owned by Convair, the plant became a division of General Dynamics allowing the company to bid on U.S. aerospace contracts. With the plant's many contributions to Astronautics including development of the Atlas, General Dynamics underwent significant corporate losses throughout the duration of production at the plant. Deciding to build all future plants in its Texas location in 1965, General Dynamics ended Convair Division's production of complete airplanes. The San Diego plant continued involvement with aeronautical engineering, but the Aircraft Structure unit was then sold to McDonnell Douglas in 1994, not reserving the operation in San Diego resulting in General Dynamic's loss of jobs and the city's aircraft-building tradition. Originally planned for strictly commercial use, the plant has since been developed as a neighborhood of corporate headquarters such as ResMed, Northrop Grumman, and San Diego County Water Authority, as well as housing developments.

General Economic Impact
Composing about 15% of the county's civilian work force, General Dynamics held a major influence on the community and its ties to aircraft developments. By selling its divisions to shareholders instead of converting the company to non-defense products, the company showed no interest in keeping jobs in San Diego. The closure of the plant cost thousands their jobs. Although distribution to the company's shareholders did apply to the city's commercial economy in a rather indirect means, many locals in Kearny Mesa and in the surrounding areas suffered losses not only by needing to find a new job, but having to retrain in order to work in a different industry.

Assessment
Having many similarities to the closure of Boeing's C-17 Long Beach Plant, General Dynamics' discontinued production of aerospace technology in San Diego allows insight in how Boeing should respond towards the Long Beach community in deciding how the plant is redeveloped. Receiving a large amount of negative feedback from the community as well as city officials, General Dynamics did not show any interest in what would occur to their workers or the county as a whole in the aftermath of removing their presence from San Diego. Supplying many civilian jobs, General Dynamics shares a similar influence to the community as did the C-17 Boeing Plant in Long Beach which supplied jobs directly by the plant as well as indirectly through other companies that benefited from its aircraft production. In its recent closure, Boeing should take into consideration its effects on the community and allow the redevelopment of the land to help benefit the county economically.

Arizona (Lockheed-Martin Goodyear Plant Closure)	
Site Type	DIA
Geography	Arizona, Maricopa County
Residential Population	3,889,161 (Maricopa County, Year 2000)
Employment	(Year 2015) – 1,601,243

Employment Composition
(2016 Q2) – The region's top industries that account for about 44 percent of jobs include: Healthcare and Social Assistance (13 percent); Retail Trade (12 percent); Administrative and Support and Waste Management and Remediation Services (10 percent); and Accommodation and Food Services (9 percent). However, the Finance and Insurance industry has the highest regional concentration compared to the national average, with a location quotient of 1.66. Healthcare and Social Assistance (two percent) is projected to grow the fastest over the next five years.

Timeline
1993-2015, Lockheed-Martin announced closure in 2013 citing declining federal government spending as a deciding factor to close plant, leaving 600 citizens in Goodyear jobless. Since 2008, Lockheed-Martin had reduced overhead costs, cut capital expenses, removed 1.5 million square feet of facility space, and reduced their workforce from 146,000 to 116,000 throughout the country. The Goodyear facility developed the first synthetic aperture radar systems for the military in the 1950s and 60s and continued to develop software for military sensors and communications equipment when the Goodyear Aircraft company merged with Lockheed to acquire the plant. To retain jobs and develop new growth markets, a Defense Industry Adjustment was issued to assist in rebuilding Arizona's Aviation and Defense job market by identifying emerging markets and potential gaps to be filled.

General Economic Impact
Although the direct economic impact of Lockheed-Martin's closure of the Goodyear facility does not seem to be too drastic, Arizona's defense industry faces future cuts through its defense contractors. Among the civilians who lost their jobs, many are being relocated to other states where high-wage, high-tech jobs are concentrated. With the possible risk of losing engineers and other skilled workers, Arizona's greater economy will be negatively impacted by the loss of talent. Over 10 years, austerity cuts totaled to $500 billion on the defense side causing workers and contractors to favor other states, looking elsewhere for jobs and development. A plan has been implemented to rebuild the Aviation and Defense job market, potentially lessening the negative economic impact the closure has on the community and its workforce.

Assessment
In comparison to the closure of the C-17 Plant in Long Beach, Lockheed-Martin's closure of the Goodyear plant differs in that the state of Arizona faces a larger economic impact than California. With many areas that draw companies and developers, the Los Angeles County has better opportunities to bounce back from the loss of jobs and changes within the aircraft manufacturing industry. However, the closure in Arizona suggests that to propose a redevelopment plan for the plant does not solve all the problems that are generated by major defense companies such as Lockheed-Martin and Boeing. To find use of the land helps the community jumpstart to fix any negative impacts, but the loss of jobs and relocation of workers within the county and state may evoke ripple effects through housing, commercial and retail, and related industries that can possibly change the makeup of the county's economy.

Colorado	
Site Type	DIA
Geography	The entire state is considered in the DIA grant, but areas such as Colorado Springs and the Pikes Peak region with large defense contractors tend to be the focus of the grant.
Residential Population	5,197,580 (Colorado State, Year 2014)
Employment	(Year 2015) – 2,040,004

Employment Composition
(2016 Q2) – The region's top industries that account for about 41 percent of jobs include: Healthcare and Social Assistance (12 percent); Retail Trade (10 percent); Accommodation and Food Services (10 percent); and Professional, Scientific, and Technical Services (9 percent). However, the Information industry has the highest regional concentration compared to the national average, with a location quotient of 1.38. Healthcare and Social Assistance (two percent) is projected to grow the fastest over the next five years.

Timeline
Colorado economic development officials received their DIA grant in 2014. They are well into their planning process.

General Economic Impact
Unlike other DIA grants that are focused on recovering from a sizable single plant or facility closure, the Colorado DIA grant is looking to "provide immediate assistance to Colorado firms and employees impacted by reduced Department of Defense procurement". Assisting manufacturers hurt by reduced defense spending, the $6.6M grant introduces nine projects aimed to provide tools for new facilities to reposition them for success and to support more advanced manufacturing. The project timelines are ambitious and quick in developing each economic strategy in order to generate a statewide effect.

Assessment
Although Colorado's Defense Industry Adjustment grant is not aimed to aid a specific area affected by the closing of a plant, the plan gives insight that may be applied to the closing of Boeing's C-17 Plant in Long Beach. With the defense industry's spending composing more than 4.3 percent of the state GDP, Colorado's workforce and economic system rely highly on the prosperity of large defense contractors. This particular DIA grant suggests that the state can and should assist defense companies and firms even before they are forced to close or move out of the area. Colorado's attentive and reactive plans to address a statewide-response in fluctuations of funds for defense spending allow less drastic changes and effects on the workforce and areas with large defense contractors such as Colorado Springs and the Pikes Peak region.

Massachusetts	
Site Type	DIA
Geography	With its focus on the entirety of Massachusetts, the Defense Industry Adjustment grant applies to over 2,500 businesses tied to the Department of Defense and Homeland Security through 17,042 contracts.
Residential Population	6,657,291 (Massachusetts State, Year 2014)
Employment	(Year 2015) – 2,870,270
Employment Composition	
(2016 Q2) – The region's top industries that account for about 47 percent of jobs include: Healthcare and Social Assistance (18 percent); Retail Trade (10 percent); Educational Services (10 percent); and Professional, Scientific, and Technical Services (9 percent). Professional, Scientific, and Technical Services has the highest regional concentration compared to the national average, with a location quotient of 1.40, but Healthcare and Social Assistance (two percent) is projected to grow the fastest over the next five years.	
Timeline	
Colorado economic development officials received their DIA grant in 2014. They are well into their planning process.	
General Economic Impact	
With its rather broad focus on the state of Massachusetts, the DIA grant looks to control and lessen the severity of job losses associated with the decrease in defense spending. Supporting local adjustment and diversifying the state's $13.9 billion industry, the general economic impact can be expected to be controlled and sustain a positive if not neutral response to the projected budget cuts for the defense industry.	
Assessment	
With Massachusetts' strong economic ties to their defense sector, a $13.9 billion industry employing over 130,000 people, their Defense Industry Adjustment grant given in 2015 of $1.4 million and the additional grant received in 2016 of $1.7 million will allow the state to prevent any negative effects that would occur not only for the defense sector, but for the state's economy as a whole. MassDevelopment, the state's economic development and finance agency, is partnering up with the Massachusetts Manufacturing Extension Partnership and the Smaller Business Association of New England to assist defense-related businesses transition and expand into civilian markets. A similar response could take place in Long Beach due to the closing of Boeing's C-17 plant. With many civilians invested in the private company's prosperity, a plan to transition the industry and diversify the workforce and the economy as a whole would allow an easier adjustment to reductions in defense spending and the closures of large contractors, such as Boeing. Rather than simply focus on redeveloping the former C-17 plant, Los Angeles County should also seek methods and opportunities to assist civilians in finding new employment as well as shifting the economic focus from the defense sector to a more diversified economy.	